DOCUMENT RESUME

ED 200 721 CE 028 398

AUTHOR	Goldstein, Harold
TITLE	Training and Education by Industry. Worker Education and Training Policies Project.
INSTITUTION	National Inst. for Work and Learning, Washington, D.C.
SPONS AGENCY	National Inst. of Education (ED), Washington, D.C.
PUB DATE	80
CONTRACT	400-76-0125
NOTE	81p.; For related documents see CE 028 399-412.
AVAILABLE FROM	National Institute for Work and Learning, Suite 301, 1211 Connecticut Ave., N.W., Washington, DC 20036 (Order No.: PRM2, $12.50).
EDRS PRICE	MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS	*Education Work Relationship; *Employer Attitudes; *Employment Practices; *Government Role; *Job Training; *Labor Education; On the Job Training; Professional Personnel; Sales Workers; Semiskilled Workers; Skilled Workers; Unskilled Workers
IDENTIFIERS	*Private Industry

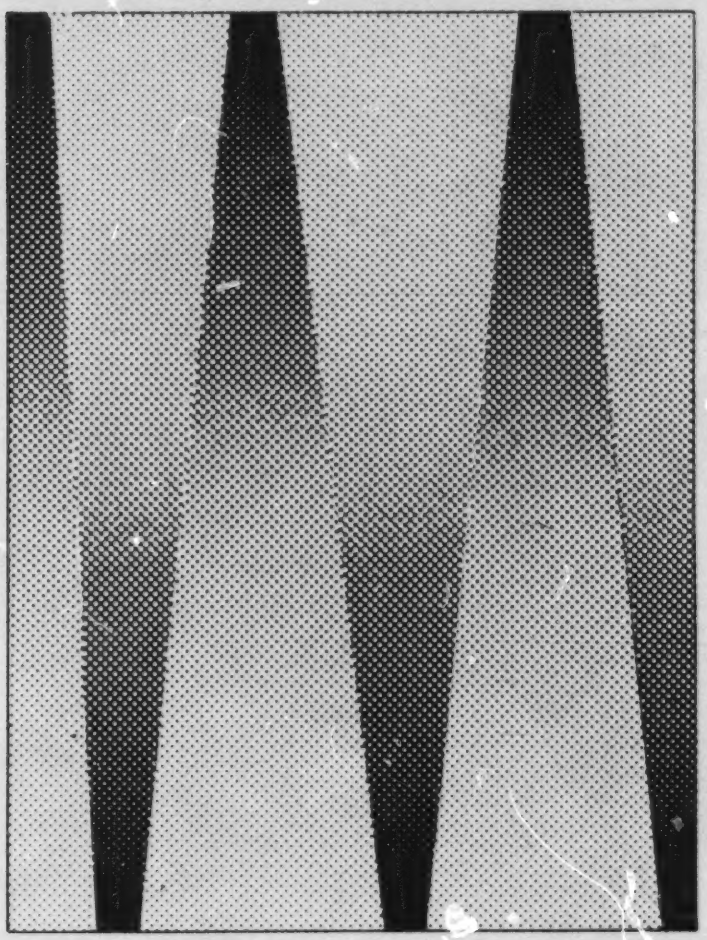
ABSTRACT

Interest in recent years has centered on the purposes, forms, effects, and magnitude of private sector training of employees. Demand for detailed and accurate information on these subjects has arisen within idustry itself, within government agencies, education and research institutions, and organized labor. This monograph is an attempt to supply a description of such private sector training efforts. Included in this monograph are an examination of the role of employer-provided education and training viewed as a part of the total skill acquisition structure; a description of the needs and motivations for employer-sponsored training; important new estimates of the amounts being spent on various kinds of training; a discussion of new challenges and problems industry-provided education and training is being called upon to meet; and finally, a discussion of the role the government has exercised and should be expected to take in enhancing the ability of industry education and training to meet these new challenges. Of the many findings and recommendations contained in this study, one of the strongest is the case made for developing record keeping in the education and training area. (KC)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED200721

Worker Education and Training Policies Project



Training and Education by Industry

Harold Goldstein

1980

CE 028 398

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

"PERMISSION TO REPRODUCE THIS MATERIAL IN MICROFICHE ONLY HAS BEEN GRANTED BY

A. E. LaPointe

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

2

$12.50

This is one in a series of policy research monographs commissioned by the Project on Worker Education and Training Policies of the National Institute for Work and Learning.* Funding support for this project and the commissioned papers was provided by the National Institute of Education, U.S. Department of Education under contract number 400-76-0125.

The authors of the policy research papers in this series are knowledgeable analysts both from within and without the National Institute for Work and Learning. Their charge was to explore one or more issue areas which the project identified as being of significant interest to public and private sector decision makers concerned with shaping worker education and training policy and practice for the coming decade. Authors were asked to synthesize the relevant research bearing on the issue areas, to assess the knowledge base with a view to discerning the points of public and private policy relevance, and to use their best independent professional judgements in offering recommendations for action.

Therefore, it is important to note that the opinions and points of view presented in this and other papers in this series do not necessarily represent the official positions or policy of either the National Institute of Education or of the National Institute for Work and Learning.

Copyright © 1980 by the National Institute for Work and Learning. All rights reserved.

"Copyright is claimed until February 5, 1985. Thereafter all portions of the work covered by this copyright will be in the public domain." Per copyright authorization agreement dated 2/5/80, docket No. 860-80 between the National Institute of Education, U.S. Department of Education, and the National Institute for Work and Learning.

Formerly the National Manpower Institute

THE NATIONAL INSTITUTE OF EDUCATION

U.S. DEPARTMENT OF EDUCATION

HAS PROVIDED THE FUNDING SUPPORT
NECESSARY FOR THE DEVELOPMENT OF
THIS POLICY RESEARCH MONOGRAPH.

ABOUT THE AUTHOR:

HAROLD GOLDSTEIN

Dr. Harold Goldstein was Assistant Commissioner for Manpower and Employment Statistics, Bureau of Labor Statistics, from 1959 to 1972, He has since served as a counsultant to such national and international organizations as the National Manpower Institute, the National Commission on Employment and Unemployment Statistics, the National Academy of Sciences and the World Bank. Among his many publications is A Critical Look at the Measuring of Work, with Willard Wirtz, NMI, 1975.

NATIONAL INSTITUTE FOR WORK AND LEARNING

NATIONAL ADVISORY COMMITTEE MEMBERS

For The
WORKER EDUCATION AND TRAINING POLICIES PROJECT

Ms. Marla Batchelder
Director of Professional Development
McGraw-Hill Publishing Company

Dr. Marvin Berkeley
Dean
School of Business
North Texas State University

Mr. Joseph M. Bertotti
College of Business Administration
University of South Florida

Mr. Len Brice
Executive Vice President
American Society for Personnel Administration

Mr. Bruce Carswell
Vice President
Human Resources and Administration
General Telephone and Electronics

Mr. John Chadwell
Manager
Personnel Administration
Owens-Illinois, Inc.

Mr. Robert Craig
Director of Communications
American Society for Training and Development

Mr. Walter Davis
Director of Education
AFL-CIO

Mr. Richard Drabant
Manager, Marketing
Chrysler Institute
Chrysler Corporation

Dr. Murray Frank
Dean
College of Public and Community Services

Mr. Donald Fronzaglia
Director of Personnel
Polaroid Corporation

Mr. Sean Gibney
Director
District Council #37
Education Fund, AFSCME, AFL-CIO

Mr. William Gary
Director
Department of Social Action
International Union of Electrical, Radio and Machine Workers (IUE)

Mr. Nathaniel Hackney
Hospital & Health Care Employees Union
District 1199 - Training Fund

Dr. James Hall
President
Empire State College

Mr. Reese Hammond
Director of Education and Training
International Union of Operating Engineers

Mr. Richard Holan
Director
Education and Training
United States Steel Corporation

Mr. Richard Hupp
Director of Recruitment
Kimberly Clark de Mexico, S.A.

Mr. Carroll Hutton
National Education Director
United Auto Workers

Mr. Robert L. Jones
Director
Personnel Programs and Services
General Motors Corporation

Mr. John Kulstad
Director
Education Department
Communication Workers of America

Dr. Norman Kurland
Executive Director
Adult Learning Services
New York State Department of Education

Ms. Joyce Miller
Vice President and Director of Social Services
Amalgamated Clothing and Textile Workers Union

Mr. Robert Nielsen
Assistant to the President
American Federation of Teachers

Mr. John A. Stagg
Director
Education Department
Graphic Arts International Union

Mr. Peter Williams
Program Director
Educational Development
IBM Corporation

Dr. Roger Yarrington
Vice President
American Association of Community and Junior Colleges

Mr. Kiernan O'Reilly
Director
Management Education & Functional Programs

Dr. Russell Farnen
Assistant to the Executive Vice President
Empire State College

FOREWORD

The purposes, forms, effects and magnitude of private sector spending for workforce education and training have become, in recent years, for many and varied reasons, subjects of intense interest and no little speculation. Demand for detailed and accurate information on these subjects has arisen within industry itself, within government agencies, education and research institutions and organized labor.

Stimulating that demand are a diverse array of interests and concerns. Among them:

- o continuing anxiety about a declining rate of productivity growth, and its effects on inflation and our competitive position in the world economy, combined with an appreciation that past and future levels and kinds of investments in skills formation might well be part of the cause and solution of present problems;
- o concern about the ways and means by which equal employment opportunity gains for minorities, women, older workers, handicapped and other groups can be effectively sustained in the years ahead;
- o concern about whether our public education and training establishments and practices are up to the task of accommodating, with short enough turn around times, the changing skill and knowledge formation needs of our economy, especially in the face of a rapidly altering demography at the workplace;
- o concern about whether the aspirations and expectations of the workforce of the 1980's can be accommodated within traditional pyramidal-type occupational structures and rewards, in the absence of other human growth options;
- o and an emerging appreciation that to achieve mastery over the demands of everyday life and to participate in an informed way in political affairs and decision-making both require of Americans an increased sophistication obtained only through continuing learning, and, increasingly, through organized learning.

We know now that during the past 20 years a vast and diverse educational enterprise has emerged within private industry - particularly large industry. We suspect that how and how well it functions and what kinds of opportunities it creates will importantly effect how these concerns and national challenges are met.

But as each of those seeking information on private sector education and training have discovered, precious little of the detail of the whole of this system has been available. When this policy research paper was commissioned in 1979, the situation was little changed from that obtaining in the mid-1970's when Seymour Lusterman labelled industry education and training the "shadow education system."

The details of that system, we are learning, may well amount to a set of key indicators of our economic and social well-being. An appreciation is emerging that what is going on within industry will decisively shape the worklife education opportunity structure we will have in the decades ahead. And while present interest reminds us that here are some numbers on which we should be keeping close tabs, our practice has been not to record, collect or analyze them.

Those in industry, government, labor, and education concerned with human resource development issues, and all those concerned to have a clearer picture of the industrial education and training enterprise will welcome this contribution by Dr. Harold Goldstein. Presented here in clear and entertaining language are: an examination of the role of employer-provided education and training viewed as a part of the total skill acquisition structure; a description of the needs and motivations for employer sponsored training; important new estimates of the amounts being spent on various kinds of training; a discussion of new challenges and problems industry provided education and training is being called upon to meet; and finally a discussion of the role government has excercised and should be expected to take in enhancing the ability of industry education and training to meet these new challenges.

Of the many findings and recommendations contained in this study, one of the most compelling from this reader's vantage, is the strong case made for moving matters forward to develop our record keeping in the education and training area. As Willard Wirtz and Harold Goldstein put it in A Critical Look at the Measuring of Work, "We tend to do what we measure." The movement toward greater opportunity for worklife education and training seems certain to require something more than faith and belief in the positive effects of education, if further broadening of opportunity is to occur.

Gregory B. Smith
Director
Worker Education and Training Policies
Project

TRAINING AND EDUCATION BY INDUSTRY

TABLE OF CONTENTS

Chapter		Page
I.	INTRODUCTION	1
II.	THE ROLE OF EMPLOYER-PROVIDED TRAINING	3
	A. The System for Skill Acquisition in the United States	3
	B. The Needs Employer-Provided Training Must Meet	7
	C. Modes of Training	14
	D. Economic Theory Bearing on Training	18
III.	THE EXTENT OF TRAINING	22
	A. Measuring Training Activity	22
	B. Firms that give Training and Workers Who Get It	26
	C. Training as Seen by Workers	34
	D. Cost of Training	38
IV.	NEW CHALLENGES FOR TRAINING	42
	A. Training for Productivity and Growth	42
	B. Training for Changing Skill Needs	45
	C. Training in Aid of Affirmative Action	48
	D. Evaluation of Training	49
V.	THE ROLE OF GOVERNMENT IN SUPPORTING TRAINING PROVIDED BY EMPLOYERS	52
VI.	RECOMMENDATIONS	61
	A. Data Collection	61
	B. Technical Aid to Training	62
	C. Financial Aid	63
APPENDIX:	SOURCES FOR DATA IN TABLE 1	65
REFERENCES		66

I. INTRODUCTION

The contribution of work skills to economic growth, productivity gains, and rising average income levels is illustrated by the finding that the educational level of the work force (which is a measurable proxy for work skills) has contributed a significant fraction of the national productivity growth in the United States in the past half-century (Denison, 1976). Equally important is the contribution work skills make to the life of the individual worker by promoting his or her ability to earn a living, to make maximum use of personal capacities, and to attain the satisfaction that comes from a feeling of competence and independence.

People acquire work skills by general education, vocationally-oriented education at all levels, including professional, and learning opportunities provided by employers, either on the job or in special programs. The way in which these three modes are combined differs widely from one situation to another, depending on the individual, the occupation, and the social milieu. The major role of employer-provided learning is to adapt previously acquired general knowledge and skills to the needs of the job. But because on-the-job learning often comes after the others, it has to serve also to make up for their deficiencies. And because employer-provided learning serves the functions both of enhancing skills for promotion and of changing skills for adaptation to changing technology, it must often include general knowledge and involve a return to school. Thus, training provided by employers serves the critical role of completing the process of skill acquisition and includes necessary general learning as well as specific vocational preparation.

Because of its importance as the capstone of skill acquisition, employer-provided training is the focus of intensive interest. Workers see good training as contributing to their income and chances for promotion; many collective-bargaining agreements provide for and regulate training. To minority workers, access to training opportunities is a key to equal opportunity not merely for employment but for promotion to the better-paying, higher-status jobs. Employers see training in a variety of ways: some as a burden and cost--especially if trained workers quit and take their newly acquired skills to another firm; others as essential to assure a supply of skilled workers, improve productivity or quality of service, adapt to new technologies or ways of doing business, or attract and retain workers in the firm. The public interest is in enhancing productivity and economic growth, reducing structural unemployment by retraining workers with obsolete skills or giving disadvantaged workers entree into jobs.

This paper will focus on employer-provided training, both on-the-job and that provided by more formal methods, including helping the worker to take courses in schools. It will not deal with work-study or cooperative programs in which students are given opportunities to work while still in school as a part of the learning and maturation process. This paper will deal only with the private economy, although government agencies also conduct training for their employees. It will examine the role of employer-provided training in the total system--if it can be called a system--for skill acquisition. It will describe the needs and motivations for training and the amounts and kinds of training provided. It will present new challenges and tasks that training will be called upon to cope with. And, finally, it will discuss what role government should take in enhancing this type of training.

II. THE ROLE OF EMPLOYER-PROVIDED TRAINING

This section will begin by discussing the ways in which people acquire work skills in the United States, and how general education, vocationally-oriented education, and on-the-job learning contribute to skill acquisition. It will describe the needs employer-provided training is designed to meet and the kinds of training given. The insights provided by economic theory will be briefly summarized.

A. The System for Skill Acquisition in the United States

The term "system" in this context implies no integrated, planned, or even systematic arrangement, but rather the variety of modes, methods, and institutions that have developed, each more or less independently of the others, some competing for clients, and related only in that each is shaped to some extent by the existence of the others and by its efforts to find a niche for itself in a busy marketplace.

To put some order into this, one may distinguish among general education, vocationally-oriented education,* and on-the-job learning. But, in fact, no element of the system serves one of these purposes solely. The high school and the four-year college are thought of as providing general education, yet high schools not only provide courses identified as "vocational education," but also give students pursuing an academic track the opportunity to learn such job-related skills as typing,while colleges provide a variety of major fields of specialization that are designed to qualify the graduate for entry into certain professional or technical occupations. Similarly, there is a general educational component--usually a weak one--

---

*This clumsy expression refers to any education program designed to impart skills that will qualify the student for entry into a specific occupation. It includes vocational education as generally understood, as well as college education in engineering, law, or other occupations, and many programs at the community college or technical institute level.

in many vocationally-oriented education programs. Finally, employer-provided training, whose main function is to adapt the school-learned skills to the way work is conducted in the firm, finds itself providing some general education, whether to make up for the deficiencies of the school system (for example, teaching "communications skills"--how to write in English) or to give management personnel a background in psychology, economics, mathematics, or natural sciences as part of training in broad management skills.

The general level of educational attainment in the United States is high in the sense that most people get many years of schooling. The current situation is more accurately portrayed by the educational experience of young adults than by that of the entire adult population or the labor force, since school attainment has increased in recent decades. More than four-fifths of the youth in their early twenties had completed 4 years of high school or more in the mid-seventies, and more than one-fifth had completed 4 or more years of college (Census, P-20, No. 274, Table 1). Among black youth, 72 percent had 4 years of high school or more. Thus, even allowing for some of the well-publicized deficiencies of high school education, a high proportion of youth has attained literacy and a knowledge of general arithmetic and science that serves as a background for learning work skills.

In addition to general education, there is an extensive enterprise providing vocationally-oriented education. To show the relative size of the components of this activity, one may use either enrollment data or statistics on graduations. Enrollments are useful as a measure of the volume or work-load of the training effort, but not as a measure of the number of people who benefit from the program; for example, enrollments in a four-year program will be double those in a two-year program affecting the same number of

people. Moreover, many who enroll drop out before getting much benefit. Data on graduations or completions, on the other hand, show the number of people who have gone through defined training curricula and emerged with whatever bundle of skills or learning the program has been designed to impart.

This way of looking at vocationally-oriented education is exemplified in Table 1, which shows for a recent year the outflow of graduates of the various programs and which may serve as a map of the structure of this type of education.[1]

The size of these graduating classes is impressive when placed into perspective by comparison with the population at the typical ages when these courses are completed. Those completing vocational education in secondary school amount to nearly one-third of the 18-year-olds. Those completing courses in institutions of higher education amount to nearly as high a proportion of the applicable age groups - about 30 percent. Graduates of postsecondary public vocational education courses and private trade, technical, and business schools amount to about 21 percent of the population at appropriate ages. Adding the three figures together, we get 83 percent, but, in fact, less than this proportion of the population gets these types of education because some individuals go through more than one of the programs - e.g., a graduate of a secondary-school vocational course who later completes a postsecondary vocational course or gets an associate or bachelor's

---

[1]One component, 4-year colleges, is included even though not all of their graduates have taken courses recognized as vocational preparation. Many bachelor's degree graduates are qualified for employment on the basis of their degree, including graduates in architecture, engineering, accounting, business, journalism, nursing, computer sciences, education, physical and occupational therapy, medical laboratory technology, dental hygiene, and dietetics. Liberal arts graduates, though not qualified by their baccalaureate to work in their major fields, are sought by many employers who hire college graduates for sales or management trainee positions.

Table 1. Vocational Preparation Institutions in the United States and Their Output: Numbers of Persons Completing Various Types of Vocationally-Oriented Education, as a Percent of the Population at the Relevant Age, 1976

Type of Institution	Number	Percent of Relevant Age Cohort
Secondary school vocational curricula	1,378,000	32.5
Postsecondary vocational curricula, non-college, total	885,000	20.9
Public	537,000	12.7
Private	348,000	8.2
Institutions of higher education, total	1,169,000	29.8
Community college occupational curricula	243,000	5.8
4-year college, no graduate or professional degree	551,000	14.0
First professional degrees (health fields, law, theology)	63,000	1.7
Graduate degrees, masters*	312,000	8.3
Adult and on-the-job programs, total	984,000	-
Apprenticeship (registered programs)	49,000	1.3
Military training applicable to civilian jobs	475,000	12.6
Adult vocational education	235,000	-
CETA classroom (130,000) and on-the-job (63,000) training	193,000	-
Job Corps	32,000	-

Sources and notes: See Appendix.

* An additional 34,000 doctorate degrees were granted, but these are excluded from the table to avoid double-counting since most of them had previously received master's degrees.

degree at a higher education institution.[2] Offsetting this double-counting, however, are two groups: the large number who drop out of these courses before completing them, but who receive a partial vocational preparation, and those who complete an adult or on-the-job training program such as those shown at the bottom of the table. Nearly a million people completed these, including military training of the kind applicable to civilian jobs, adult vocational curricula, CETA training, formal apprenticeship and Job Corps training. For most of these, an applicable age group cannot be identified.

What this table shows is that the number of people completing vocationally-oriented courses annually is not far below the total size of the population cohort entering the labor force. It is apparent that most workers get not only 12 or more years of general education but also some significant occupational preparation in school and come to their jobs with at least some theoretical background for an occupation and some partly developed work skills. Only a minority - although a significant number - of the youth enter the labor force without having completed a vocationally-oriented curriculum, including those who do not finish high school and many of those whose high school education was general or academic, or whose college degree was in liberal arts.

B. The Needs Employer-Provided Training Must Meet

The workplace picks up where the schools left off. For new workers, several things must be accomplished by employer-provided training. First, the general skills they have acquired must be supplemented and focused

---

[2] In 1976, 24 percent of those completing secondary school vocational curricula continued full-time school, according to follow-up surveys reported by the Office of Education (1978, p. 16).

to adapt to the way work is done in the enterprise. Second, in many cases, orientation to the firm's policies, rules, and organization is provided. And, third, in all too many instances, the deficiencies of the vocational preparation, and even of the general education, must be made up.

The latter function of entry training has been well publicized. A frequent complaint of industry over the years has been that the schools are not doing their job. This is voiced with respect to basic skills that the schools are assumed to be competent to provide, such as the three R's, as well as to vocational skills. A common criticism of vocational education at the secondary school level is that it teaches obsolete methods on antique equipment. That some Masters of Business Administration have had no courses in accounting is the complaint of many employers, often accompanied by the bitter remark, "The thing they teach best is arrogance." This has been a long-standing problem, arising out of rigidities and traditionalism in educational institutions and failures of communication between them and employers. As long as employers cannot get these deficiencies corrected by the schools, they will have to continue to make them up in their own training.

In addition to introducing new workers, employer-provided training performs several other functions: upgrading skills for promotion, retraining where new production methods are introduced, and adapting managerial personnel to new products or new climates affecting business, such as government regulations on worker safety, environmental pollution, or affirmative action for equal employment opportunity.

Sometimes the training is given in belated recognition of a serious deficiency in work skills. This is dramatically illustrated in two new headline-making training programs begun in the summer of 1979: the creation

of a Nuclear Operations Institute to set up a training program for operating staff of nuclear electric generating plants following the Three-Mile Island near-disaster (Washington Post, June 29, 1979), and the special training program for maintenance workers on DC-10 airplanes following the crash of an American Airlines plane in Chicago.

Several other reasons for training in industry may be identified. One is the desire to assure "occupational vitality - morale, in the sense of commitment to work - particularly among professionals and managers" (Lusterman, 1977, p. 6). Another is the desire to stabilize employment, reduce turnover, and fill needs for shortage skills from within. Still another purpose is to make the firm attractive to workers, who may be willing "to trade lower pay for learning opportunity" (ibid.).

The focus of training differs among occupations, partly reflecting the relative roles of schooling and experience in skill development. For managerial occupations, with their great inter-firm mobility, orientation to the firm is an important reason for training. Also, as the development of new management methods (such as "management by objective") seizes the imagination of administration, or as the climate in which business is done changes - for example because of new regulatory laws - management must be trained to cope (Myers, pp. 71-80; Clark and Davis, p. 179).

Training is given for sales workers to acquaint them with new products, as well as to improve their sales techniques. In some subject fields, there is little training available except through the firm. For retail sales people, the subject matter in which training is needed is not complex, but high turnover requires a constant volume of short-duration training, limited by the inadvisability of investing too much in any individual (Clark and Davis, p. 181).

Supervisory training concentrates on how to supervise and how to teach, as well as how to operate under new personnel practices, such as those required by equal employment opportunity laws.

For craft and operative workers, training focuses on promotion and skill upgrading, including full craft training by systematic rotation through a variety of operations and short-term training. Automobile and appliance companies train not only production workers but also servicemen and repairmen, both their own employees and those of their customers or dealers.

Clerical workers receive much of their initial skill development in schools (both secondary schools and private business schools) and employer-provided training tends to be general orientation plus special programs for such occupations as key-punch operators or bank tellers (Myers, pp. 51-60).

Training for professional and technical workers - the occupations for which schooling is most extensive - is largely for upgrading and for updating skills to keep up with changing technology in their fields. Many professional workers move up to managerial jobs for which their professional education has given them little preparation, and training or outside courses are often focused on broadening their skills (Myers, pp. 61-70).

The special needs for training in industrial organizations reflect their technology and structure, as well as the occupations they employ and the modes of preparation available for these operations. Industry's role depends in part on how much of the training in the various occupations is done by the schools. For example, according to its assistant vice-president for training and education, the Bell System can hire already-trained workers in only a few occupations, including automobile mechanics, some clerical and data systems jobs, and professional jobs such as accountant, lawyer, physician, nurse,

psychologist, and engineer. These are the exceptions, and even in these jobs there are many skills and much knowledge specific to the Bell System to be learned before the already-available skills can be effectively applied. For most of its jobs, Bell gives initial formal training and continues to provide training from time to time (W. Frank Blount, in testimony before Senate Committee on Labor and Human Resources, June 6-7, 1979).

The effect of the structure of the career ladder in industry and the role of school-based preparation in skill development is illustrated in the contrast between the job and promotion structure in hospitals and that of industries such as steel, automobiles, and petroleum refining. Hospitals employ many occupations for which training is provided in schools, including pharmacists, X-ray technologists, respiratory therapy workers, occupational and physical therapists, audiologists, dieticians, and speech pathologists. These workers are hired from outside and given little or no training by the hospital. Nor can workers hired in entry jobs, such as hospital attendants, aspire to promotion into these jobs. Training in hospitals is for limited objectives - qualifying untrained workers for employment and upgrading within groupings of jobs where some promotional opportunities exist (U.S. Department of Labor, Occupational Outlook Handbook, 1978-79 Edition, pp. 447-515). Such untrained workers, however, amount to 60 to 70 percent of hospital personnel, and increasing attention is being given to their training (D.L. Kimmerly, Vice President, Human Resources, Michael Reese Hospital and Medical Center, Chicago, in U.S. Department of HEW, National Institute of Education, 1979).

In steel, automobiles, petroleum, and chemicals, well-defined promotional sequences and tall promotion ladders are found; a worker is hired as a yard laborer or other unskilled worker and works up to semi-skilled and often

skilled production and maintenance jobs. Few jobs are filled by hiring, except at the bottom. In men's apparel and many shoe and textile plants, on the other hand, there is an open structure, so that practically every job is a hiring classification. There is little or no movement within the plant. The structure determines which skills the employer trains himself and which he expects some other training institution to produce. This is affected by the extent to which the skills are firm-specific, in which case there is more likely to be internal promotion and training (Doeringer, in U.S. Department of Labor, Manpower Administration Monograph No. 7, 1968, pp. 9-10).

In summary, the use and role of training within industry differs, depending on the contribution of schools in preparing for specific occupations and on the career ladder structure of the industry or the firm which tends to think of training that it engages in as a necessary business expense, not primarily as a fringe benefit for employees. A survey of training in industry reported:

> While incidentally supportive of the job and career aspirations of participating employees, most employer-sponsored education and training stems from business needs . . . Only a small number [of business executives] think . . . that these programs include subjects or skills that "are really the responsibility of the schools to provide." Typically, these spokesmen regard all or most of their companies' education and training activities as legitimate and necessary business functions (Lusterman, 1977, p. 1).

That there are some doubts in industry about this serious view is brought out in the comment of a steel company executive cited in the same report (p. 6): "Training has often been a form of entertainment in industry." One devotee of training comments bitterly that "training is the stepchild of the world of work and is not taken very seriously at all" (Gilbert, 1976, p. 4). And skepticism about training is reflected in the reasons given by

respondents to a Bureau of Labor Statistics survey for the fact that they do not provide formal training: the most common reason was that "informal training satisfies the needs," but more than a quarter of the respondents in metalworking industries said they preferred to recruit trained workers; many said they had so few skilled jobs that structured training was unnecessary; about one-quarter said they did not have the capability to provide structured training; and a few pointed to the risk of training workers and then losing them to other firms (U.S. Department of Labor, Occupational Training in Selected Metalworking Industries, 1974, pp. 11-13).

The attitudes and motivations of employers with respect to training, then, are not entirely uniform. Organized labor also has mixed attitudes. On one hand, some unions are supportive of training, and especially of apprenticeship; training is seen as the route to promotion and to improving the individual worker's earning power and marketable skills. Training is regulated by many collective bargaining agreements; in 1976, 695 out of 1570 major agreements (covering 1,000 or more workers) analyzed by BLS had apprenticeship provisions. These agreements covered nearly half of the 6.7 million workers covered by the major agreements. Provisions about other training on the job were negotiated in 589 agreements, also covering nearly half the workers. These programs were designed to qualify workers in different or higher skills or to upgrade existing skills. Such agreements were found in every one of the 31 industries analyzed, with the largest number of workers covered by them showing up in transportation equipment and primary metals manufacturing and in transportation and construction. In 78 agreements, covering about 12 percent of the workers, tuition aid was provided (U.S. Department of Labor, Characteristics of Major Collective Bargaining Agreements, July 1, 1976, p. 76).

Labor's concern about training stems from its effect on workers' earning ability and security, from a desire to control the supply of labor to prevent an excess of trained workers over job opportunities, and from a concern about the potential for abuse of government subsidies. Where subsidies exist, unions want to prevent employers from taking advantage of the subsidy and then discarding the worker, using him or her only while subsidized and in lieu of workers to whom the firm would otherwise have to pay a full wage. Unions press for creating openings for the new workers being trained, so that they can stay with the company and start a career, and urge that to create these openings, other workers should be upgraded. "The solution to the problem of structural unemployment relies heavily on the career ladder concept" (Fry, 1979, p. 10).

Another labor concern is to assure access to training when technological change threatens to make some jobs obsolete. Many union agreements call for advance notification of impending technological changes and provision of retraining for employees potentially displaced (Belitsky, 1977, p. 9). (Provisions of major collective bargaining agreements as of 1967 are summarized in Task Force on Occupational Training in Industry, 1968, Vol. 11, pages 82-93.)

C. Modes of Training

Training provided by employers takes several forms, uses a variety of methods, and, as indicated in the previous section, includes a wide range of content, depending both on the skills to be imparted and the purpose of the training.

In form, training runs the gamut between informal and highly formalized. The traditional way many jobs are taught is to put the worker on the job with a few brief instructions from the supervisor or a fellow worker, and

keep an eye on the new worker to correct mistakes. For complex jobs, the worker begins on a simple task and goes on to others when this task is mastered. The worker learns by watching others, by trial and error, by informal discussion or even by trying out other tasks in lunch break, and by moving around in the plant. More formal training comes in when the worker is put through a systematic rotation of tasks to develop a rounded skill.

In a complex organization or where knowing something of the technology is important to the job, even more formal training may be introduced. The worker thus learns the "why" in addition to the "how" (Clark and Davis, 1975, p. 178). Instruction may be given individually or in a small group, in a classroom at the plant, by lecture, or through audio-visual aids, programmed learning, or other methods more flexibly adapted to teaching an individual. Finally, arrangements may be made for courses at a local school or for bringing an instructor from the school into the workplace. For school programs, employers pay all or part of the tuition ("tuition aid"), and sometimes the workers are released for this training during working hours, while receiving their regular pay.

Apprenticeship is a time-honored mode of on-the-job training, involving systematic rotation through a series of tasks over several years, as well as classroom instruction in the theoretical aspects of the craft. As shown in Table 1, only about one percent of the new workers complete formal apprenticeships registered with official bodies. An additional number, which is estimated to be about half again as many, complete apprenticeships not so registered (Swerdloff, 1978). In addition some companies provide less formal programs for training craft workers, involving more on-the-job experience, with less rigid sequences of assignments and about half the classroom

instruction required for apprenticeship; such programs may take eight or more years to complete, compared to 4 years for the typical apprenticeship (Employment and Training Report of the President, 1977, page 97).

This variety of modes represents a continuum over the range of degrees of formality, and each employer has the opportunity to choose for each training program the method best adapted to the company's needs. A variety of considerations affects the choice. The informal or minimally formal training at the work station "emphasizes learning by doing and keeps theoretical explanations to a minimum," one study points out. "This is particularly attractive to people who have been 'turned off' by earlier experiences with book learning, or who for other reasons learn best from concrete occurrences" (Belitsky, 1977, p. 10). The concrete learning that occurs in this situation is less likely than a classroom experience to impart a generalized skill that the worker can take to other jobs and therefore is preferred by those employers who fear losing their investment in training as a result of turnover.

On the other hand, the "buddy system" by which the new worker learns from an experienced worker is not always welcomed by the latter; there is a traditional fear of giving away methods learned by long experience to a new (and sometimes younger and more vigorous) worker who can soon attain equal or even greater productivity. Workers sometimes say that the worker who learns by watching his or her fellows is "stealing the job." Where job security is not assured, this fear can be a potent force. Also, a common view among professional training officers is that completely informal instruction by a fellow worker is not always desirable because it may lead to inculcation of negative or counterproductive attitudes (Robert Allen, in Craig (ed.) 1976). (It is difficult to see how a new worker could be

prevented from picking up attitudes from fellow workers regardless of the method by which he or she is trained.)

The more formal programs, requiring training staff, equipment, classrooms, etc., become increasingly expensive, especially when the workers' time away from production is being paid for. Tuition aid may be less costly. On the other hand, the costs and time involved in travel to a school encourage some employers to offer the training in the workplace, during or after work hours. The industry-based training programs have the advantage, when compared to schools, of not being bound by the traditional school model of classroom, course content, lecture, semesters, examinations, and credits; newer teaching technologies can be used, including programmed learning, audio-visual aids, and training targeted to the needs. Because of these and a variety of other considerations, many firms operate more than one kind of training.

There is some evidence that formal methods of training have been on the increase. According to one survey of practices in firms, exclusive use of informal methods declined from 40 percent to 20 percent from 1962 to 1969. The sample is hardly representative, however (Clark and Davis, p. 179, citing a Bureau of National Affairs survey).

The costs of more formal training are one of the reasons why more of it goes on in larger than in smaller plants. Other factors are simply the need to have a "critical mass" - enough workers requiring a particular training program at a particular time to warrant setting it up, and a large enough work force to support a training staff. Vendors of training materials meet the needs of small plants to some extent by providing individualized instruction materials. Nevertheless, surveys continue to show less activity in smaller firms.

D. Economic Theory Bearing on Training

Two innovations in economic theory shed some light on the economics of training. One of these is "human capital" theory, the other, the theory of internal labor markets.

The first of these is concerned with the investment in human beings involved in giving them education or training. It examines the return to this investment in the same way as the return to an investment in any other asset is analyzed. (If this seems a cold, calculating approach, it is precisely this characteristic that places it comfortably in the icy mainstream of economic thinking.) In applying the analysis to training, Gary Becker, in the seminal work in this field, made a fundamental distinction between general and specific training (Becker, 1962, 1964). Specific training is that which prepares a worker only for work in the firm; general training prepares him or her for work in other firms as well. An example of the first is orientation to the organization of the firm, or training in a technology or process used only by a single firm. An example of the second is an apprenticeship in a craft or training in a skill that is widely employed, such as welder. Becker argues that since the worker is free to quit and carry his general skill to another job, the firm will not bear the cost of general training; instead as a result of the operation of competitive forces, the worker will bear it, through reduced earnings while in training. The worker receiving specific training, however, will receive his full wage (based on his marginal productivity), and the company will bear the cost of training.

This theory has been accepted and elaborated by many economists. Among them, Mincer estimated that the rate of return in the investment in on-the-job training was favorable: it accounted for at least one-quarter of the

considerable difference between earnings of college graduates and those of high school graduates (Mincer, 1962).

This theory presents some problems, however. One is that in practice the distinction between general and specific training is not always clear; much training has elements of both. On another aspect, as Blaug (1972, p. 194) points out, the fact that few firms have records of the costs of training - even of the direct costs, not to mention the indirect costs which include overhead, rent, workers' wages while in training, etc. - raises a question whether they have, in fact, any basis by which to reduce the wage of the recipient of general training so that he absorbs the costs. The theory depends on the existence of a perfectly free market for labor and other factors of production and fails to account for the effects of less than full mobility on the part of workers who have received general training, or, indeed, the impact of unions on wage rates (Eckaus, 1963, p. 504).

Some employers do act, at least in part, in a manner consistent with the theory; some see the possibility that they will lose trained workers by turnover as a reason for not providing training, (e.g. the responses to a BLS survey cited above) and others express a preference for giving only specific training, because they fear losing workers with general training by turnover (Clark and Davis, p. 182). This consciousness of the relationship between general training and turnover gives some support to the theory, but the news hasn't reached these employers that the workers, not they, will bear the cost of the general training.

The human capital theory has implications for the issue of government financial support for training in industry. The government's interest is in skill development for maximum viability in the labor market, and not in developing skills usable only in a single firm, so it should support general,

but not specific training. But if the cost of general training is paid for, not by the employer, but by the worker through a wage rate lower than would be warranted by his productivity, the government would be justified in contributing only if the resultant wage would be below the legal minimum wage, or so low that the worker would not be attracted to the job. This circumstance could arise, for example, if welfare, unemployment compensation, food stamps, and other benefits available to the worker made the reduced wage offered an insufficient incentive to go to work.

The theory of internal labor markets, first expressed by Clark Kerr (1950) and most recently made popular by Peter Doeringer and Michael Piore (1966, 1971), describes the "labor market" within the firm as only weakly linked to that outside. Workers enter mainly in unskilled entry jobs and advance through seniority, promotion, and upgrading training. Once in the firm, a worker's employment and wage rate are governed by factors in addition to the marginal productivity of the worker's own labor: a web of rights conferred by status, usually achieved and enforced by collective bargaining - rights to promotion, training, security of employment. The worker's status and wage are governed by rules, of which the general one is seniority. The rules, spelled out in collective bargaining agreements, specify promotion and training sequences and identify the hiring jobs or "entry ports" through which workers come from outside. Unlike human capital theory, internal labor market theory does take into account the role of unions.

To the structure of rules developed by collective bargaining has been added a new set of rules imposed by law, dealing with equal employment opportunity. These rules affect not only entry but also promotion and access to training. They will be discussed more fully in a later section of this paper; at this point their relevance to the other rules governing the

internal labor market is noted.

The implications of the internal labor market were summarized by John Dunlop, as indicating

> the crucial importance in our society of having a job. Once you have a job...many things follow. Adjustments take place in the enterprise... This underscores the importance of preparing people to get a first job, and I think this defines a major priority for public policy (U.S. Department of Labor, Work Force Adjustments in Private Industry, Manpower/Alternatives Research Monograph No. 7, p. 8.).

While it is fair to say that the theory of internal labor markets is not linked logically with the structure of neoclassical economic theory, as is human capital theory, but is rather more institutional and empirical, its insights contribute significantly to the understanding of training in industry.

III. THE EXTENT OF TRAINING

This section will attempt to sketch out the extent or prevalence of training provided by employers and the different forms that it takes. After a brief discussion of problems in measuring training, it will look first at what the available statistics say about the number and proportion of firms that give formal training and the types of firms that do so (i.e., by industry and size) and then at the more important question of the number and percentage of workers receiving training and their occupations. A view of training from another vantage point - reports by the workers themselves on the kinds of education and training they have received over their lives - will then be taken. Some information on the costs and benefits of training will also be sought.

The reader should be warned at the outset that what this paper has to share on this subject is frustration. How much and what kind of training goes on, who gives it, where it is given, who gets it, how much it costs, and what good it does have not been measured adequately in the United States. This is interesting in view of the millions of workers involved, the billions of dollars spent, and the hoped-for effects on productivity, worker income, international competitiveness of the nation's economy, and equality of employment opportunity.

A. Measuring Training Activity

To begin with, we must face the fact that the mode of training that appears by common observation to be the most prevalent - informal learning under the eye of the supervisor or fellow worker - is not going to be measured by any survey of employers. Such informal on-the-job learning is seen as an integral part of the training process even by firms that provide

formal training.

> Increasingly, off-the-job instruction and periods of work are being viewed as integrated parts of a learning experience or developmental whole. Indeed, to many executives, efforts during recent years to link these two learning modes have been the most significant development in the field (Lusterman, 1977, p. 9).

Informal training cannot be measured because records are not kept, and, since both the training and the production are joint products of the same effort, no cost data can be developed.

Even a somewhat more structured mode of training - systematic rotation of the employee among an number of tasks so that he or she develops a rounded skill - is difficult to measure, for the same reasons. A recent survey excludes such training from its definition, unless an instructor is present:

> Training is defined as a structured program to permit employees to acquire or improve skills... A structured training program must have an identifiable plan...involve the active presence of an instructor or trainer... A teaching machine or some other programmed self-learning device may be substituted... In cases of training not related to apprenticeship, a supervisor or fellow employee who, incidental to his main responsibility, gives occasional, unscheduled instruction should not be considered an instructor or trainer (BLS, 1977, p. 38; emphasis in original).

In that survey, not only completely informal training but also the first stage up to more formal training was excluded - a decision probably made in the interest of getting greater precision in what was measured. So we must be resigned to identifying and measuring only a part of the total training provided by employers.

A second measurement problem is that not all surveys obtain a representative sample of firms to survey. Some of the surveys of training in industry, including surveys whose results are very illuminating as to methods of training, practices, and costs, start with a list of firms whose

interest in training or in personnel practices has led them to join one or another association whose membership was then surveyed (for example, Bureau of National Affairs, 1978). They are obviously not typical of all firms with respect to training activity, and such surveys cannot reveal the true extent of training.

A third problem, and one on which several of the surveys have foundered, is nonresponse. Experience has shown that nonresponse is associated with lack of interest in the subject of the survey, and it is usually found that the characteristic being measured - in this case, training activity - is less prevalent among those who did not respond to the original questionnaire than among those who did. It is standard statistical practice, therefore, to follow up a sample of nonrespondents and, on the basis of the information they provide, to adjust the estimates to reflect the incidence of the characteristic in the whole universe being studied, or, if this is not possible, at least to indicate the amount of error resulting from nonresponse. Unfortunately and inexplicably, in neither of the two recent surveys on which we must depend for a measure of the incidence of training in industry was any use made of the information from nonrespondents. The Conference Board's survey (Lusterman, 1977), despite evidence from a nonrespondent follow-up that the respondents, who were only 22 percent of the original mailing list, gave more training than nonrespondents, based all its tabulations on the 22 percent. The Bureau of Labor Statistics went to the trouble and cost of visiting 550 firms who failed to respond to its mail survey, and then did not use - did not even report on - the results of the follow up; the tabulations in the survey are based on the 59 percent of the sample that responded (BLS, 1977).

In view of this disappointing performance in recent surveys by reputable organizations, it is heart-warming to see the attention to adjusting for nonresponse in the report on a 1957 survey by authors who make no claims to statistical expertise (Clark and Sloan, 1958).

A few other practices followed in the two recent surveys defeat attempts to use them as definitive measures of training activity. The Conference Board survey tabulated the incidence of each of four types of training programs reported by its respondents, but did not tabulate a simple tally of the number of firms that had any formal training, so this cannot be inferred. The BLS, in the interest of precision in manpower information, identified training in 14 specific skilled occupations, but only indirectly did they get a hint of the existence of any training for other occupations; 5 percent of the firms surveyed reported that they trained for other occupations but not for the 14, but there is no information on whether firms that provided training for the 14 occupations also provided it for others.

Another way to get a picture of training is to survey workers themselves and, in this way, measure not only current training activity but also the training received during each worker's prior life experiences, and its relation to his or her education, occupation, and personal characteristics. Several major attempts to do this have been made: a 1964 report based on a survey of a nationwide sample of workers (Manpower Administration, 1964); a question on vocational training that was asked in the 1970 Census (Bureau of the Census, 1973); and questions asked in various longitudinal surveys such as the Parnes surveys of various segments of the population (e.g. Parnes, 1974). Such surveys can provide great insight into the contribution that training and other forms of skill acquisition made in the experience of individuals. They are, however, subject to severe problems of accuracy

of reporting and of recollection of events that occurred years earlier. For example, the Bureau of the Census reports great inconsistency between responses to its 1970 census question on vocational training received and responses to a re-interview (Bureau of the Census, 1974).

The disappointing experience of trying to draw conclusions from recent surveys of training has led to somewhat more detailed and specific recommendations for improvement of statistics at the end of this report than would normally be appropriate.

B. Firms That Give Training and Workers Who Get It

A first cut at a general survey of training in the economy, conducted by the Department of Labor in 1962, showed that only one out of five establishments sponsored some type of formal training, and only 7 percent of the workers were enrolled in training at the time of the survey. Safety training accounted for half of these enrollees, and general orientation another 8 percent, so that only about 40 percent (or less than 3 percent of all employed workers) were being given skill improvement training. The largest numbers (10 percent of the trainees) were taking administrative and supervisory training; 7 percent, sales training, and 6 percent, training for the skilled trades (U.S. Department of Labor, 1965).

Typically, a higher proportion of large companies engage in training. A 1957 survey of the nation's largest corporations showed that most of them provided educational programs for their employees. Questionnaires were mailed to the 500 largest corporations as listed by Fortune magazine, and 72 percent of them responded. Of those responding, 85 percent reported some sort of educational program. (When allowance is made for nonresponse, the estimated incidence of programs is between 61 and 89 percent--i.e., if none of the nonrespondents had programs the figure for all 500 corporations

would have been 61 percent; if all of the nonrespondents had programs, the figure would have been 89 percent.) In 67 percent of the responding firms (41 to 71 percent of the total) the programs were conducted both within and outside of the firm; in 28 percent (17 to 47 percent of the total) only within the firm. Among the reporting firms, training for supervisors was most common; it was offered by 92 percent of the firms reporting. Professionals received educational programs in 71 percent of the firms, factory operatives in 45 percent, clerical workers in 31 percent (Clark and Sloan, 1958, pp. 13-24).

A broader spectrum of industry was surveyed by the Conference Board for the period 1974-75 (Lusterman, 1977). The sampling frame included all firms with 500 or more employees; firms of this size employed 32 million persons at the time, or about half the wage and salary workers in private nonfarm establishments.

In this survey the formal training modes were structured as follows: (1) Company courses, whether conducted by company personnel or outside institutions and contractors, and whether they are held on or off the company's premises; some are held during work hours, some after hours. (2) Tuition-aid programs selected and arranged for by employees, who are reimbursed fully or partly by the firm; the courses are normally after working hours, and at colleges or universities, but sometimes the instructors come to places more convenient for the employees--even in some cases to company premises. (3) Other outside courses offered by such organizations as the American Management Association, the Conference Board, professional societies, trade associations or corporate suppliers of training. They are open to employees of more than a single firm and are taken during working hours.

Among the 22 percent of firms responding, the following percentages reported having various types of training programs (Lusterman, op. cit., Table 2.6)*:

Tuition aid (for after-hours courses)	89%
Other outside courses (during work hours)	74%
Company courses (during work hours)	70%
Company courses (after hours)	39% **

The largest firms had the highest incidence of each type of program: for example, 96 percent of the firms with 10,000 or more employees had company courses during work hours, but only 55 percent of those in the smallest size class, 500-999 employees, had such programs.

The prevalence of training programs was generally similar among industries, except that wholesale and retail trade had a lower incidence of each type of program than the other sectors (Lusterman, Table 2.6).

On the critical question of the number of employees receiving training, their occupations, and the kinds of training they got, the survey report is unclear. It is possible, however, to piece together a rough estimate of the total incidence of training. Employees who had participated in company courses in the previous year totaled 4.4 million, or 13 percent of all workers in firms employing 500 or more; 3.7 million (11 percent) had participated in programs during hours, and only 700,000 (2 percent) in after-hours programs (Lusterman, p. 11). In addition to those participating in company

---

*The 22 percent response does not represent the incidence of training in the entire population, as shown by the lower incidence reported by the 51.4 percent of nonrespondents who replied to a follow-up mailing. The difference ranged from 2 percent fewer firms reporting company courses during hours to 14 percent fewer reporting outside courses during hours (Lusterman, Table C.3). With the information published in the report, it is not possible to estimate the effect of nonresponse bias. The figures cited above differ from those printed in Table 2.1 of the report, which were incorrect, according to a telephone conversation with Mr. Seymour Lusterman.

** All Lusterman tables reproduced or adapted in this paper are reprinted with permission of publisher.

courses, there were 1.3 million participants annually in tuition aid programs, or 4 percent of all workers, according to a rough estimate by the author of the study based on a 1970 Conference Board survey (Lusterman, p. 11). To this must be added the employees who participated in courses other than tuition-aid provided by non-company sources. The report gives no estimate of the number involved, but this form of training absorbed 9 percent of the training expenditures (Lusterman, Table 2.7). Making a rough estimate on the basis of the cost figures, this group of workers may have added about 10 percent to the numbers receiving training, or about 600,000. If we assume that none of these four groups of workers participated in more than one type of course, the total number of workers involved in formal training was about 6.3 million, or about one out of five of the 32 million workers employed in firms with 500 or more employees.

The percentage of employees participating in company courses (13 percent, overall) was fairly uniform in the larger size companies (14-16 percent), but in the smallest size firms it dropped to 10 percent (Lusterman, Table 2.2). By industry there was less uniformity; manufacturing firms had only 7 percent participation, finance and insurance as high as 20 percent, and in the other sectors, the range was 12 to 15 percent. Most of the participation was in courses during work hours (Lusterman, Table 2.7).

Another measure of the relative emphasis among programs is the distribution of expenditures (Lusterman, Table 2.5):

Company courses	80%
Outside courses	
Tuition aid	11%
Other	9%

Smaller firms depended more on outside courses for their training: in firms in the 500-999 and 1,000-2,499 size groups between 50 and 60 percent of the expenditures were for outside courses, while in the largest size group, 87 percent was spent in-house (Lusterman, Table 2.5).

In terms of expenditures and employee involvement, therefore, the most prevalent mode of employer-provided training in firms employing 500 or more workers was through company courses during work hours. The kinds of training given in such programs are shown in Table 2.

Table 2. Types of Courses Given in During-Hours Company Programs

Type of Course	Percent of companies providing courses	Employees involved		Expenditures	
		Number (000)	Percent of total	Millions of $	Percent of total
Management development/ supervisory	60%	1,400	37%	$ 430	24%
Functional-technical	54%	2,300	61%	1,340	74%
Basic remedial	8%	30	1%	15	1%
Other	11%	30	1%	15	1%
All courses	70%	3,760	100%	$1,800	100%

Source: Lusterman, Tables 6.1, 6.2, and 6.3.

The functional-technical category included such areas as production, maintenance, marketing, sales, service, office administration, internal systems, finance and personnel - i.e., mostly managerial and white-collar skills. Comparing these figures with the occupational distribution of the work force in the reporting companies--11 percent managerial, 12 percent professional and technical, 10 percent sales and marketing, and 67 percent all other

occupations (Lusterman, Table 2.11)--the conclusion is inescapable that training through company courses in working hours, the most prevalent mode, was disproportionately concentrated on providing managerial and other white-collar skills. This was less true in the largest companies (those with 10,000 or more employees) where 81 percent of the expenditures were on functional-technical training, while in companies with 500 to 4,999 employees about half the expenditures were in such courses (Lusterman, Table 6.6). In only 21 percent of the companies--and in only 36 percent of the largest size firms--did hourly-paid employees participate in functional-technical courses, however, and low-salaried employees participated in 22 percent of all firms and 43 percent of the largest ones (Lusterman, Table 6.7).

Tuition aid programs, although found in 89 percent of the companies reporting and therefore the most widespread mode of employer-provided training, involved only a small proportion of employees; all after-hours programs, of which tuition aid is one component, involved only 2 percent of the employees of reporting firms. In addition to improving employees' competencies and preparing them for new assignments, companies reported to an earlier Conference Board survey that such programs supported their recruitment effort, enhanced employee morale, and reduced turnover. About half the companies paid all the tuition costs, and most of the remainder either 50 or 75 percent (Lusterman, p. 34). As noted above, tuition aid and other outside courses were favored by smaller firms, who did not have the "critical mass" to make it worthwhile to employ training staffs or to offer courses in occupations with few workers.

The picture of training given by this Conference Board survey applies to plants with 500 or more employees. Some evidence about training in smaller plants is available from two surveys by the Bureau of Labor Statistics, a pilot survey conducted in 1970 (Neary, 1974) and a more complete survey conducted in 1974 (BLS, 1977). The first of these covered metal working industries, electric power, and telephone communications industries and sampled plants of 50 employees or more; the second, in the metal working industries only, included in its sample plants with one or more employees. In both surveys, training was defined to include only formal programs (including those on the job) and excluded programs for purposes other than skill development, such as general orientation, company policies and programs, safety, and supervisory practices. Only training in specified occupations was reported on (but the second survey ascertained whether, if training was not provided in the specified occupations, it was provided for other occupations).

In the 1970 pilot survey, 41 percent of the metalworking plants reporting had training for the specified occupations.* Only 32 percent of the small plants (50-249 employees) had training, 44 percent of plants with 250-999 employees, and 71 percent of the plants with 1,000 or more employees. The same pattern was found among the electric utilities: 57 percent of the small plants and 93 percent of the largest size plants had training (Neary, 1974, p. 29).

A microscope is put on the extent of employer-provided training for skilled workers in the 1974 survey by the Bureau of Labor Statistics. This

---

*In interviews with a small sample of nonrespondents it was found that only 21 percent of them had training programs, suggesting that among the 35 percent of the sample that did not respond the incidence of training was about half that among the 65 percent that did respond.

focused on the metal working industries (fabricated metal products, machinery, electrical equipment, and transportation equipment) and on the training they provided in 14 designated skilled crafts. As noted above, there was a 59 percent response, and although a sample of 550 nonrespondents was interviewed, no information about nonrespondents was used in the report on the survey.

Only 15 percent of the plants reporting provided training, ranging from 10 percent in transportation equipment to 18 percent in machinery plants. By size, half the plants in the largest size class (1,000 employees or more) gave training, and this scaled down to only 9 percent among plants with less than 20 employees (Bureau of Labor Statistics, 1977, p. 4). The training programs in 1974 enrolled 134,000 workers in the 14 occupations or about 10 percent of total employment in these occupations in the metal working industries. The largest groups of trainees were welders, 34,000, and machinists, 31,000. About 78,000 workers completed training in that year, or about 6 percent of total employment in the 14 occupations. Those completing training as welders amounted to 11 percent of the welders employed; for plumbers and pipe-fitters about the same proportion; and for electricians about 10 percent. These large percentages imply the expectation of high turnover or rapid growth. Those completing training as tool-and-die workers and patternmakers amounted to only about 2 percent of the number employed (BLS, 1977, p. 22). Unfortunately no tabulation was made of the number of workers participating by size of plant, so the contribution of small plants, which this survey could uniquely reveal, cannot be seen.

The purpose of the training was predominantly to qualify workers to enter skilled jobs; only 29 percent of the trainees enrolled were in it for skill improvement (BLS, 1977, p. 6). The most common mode of training was

on-the-job; only 31 percent were enrolled in training off the production site. Off-site training was most common for welders, however (page 7), and just over half of all training in the transportation equipment industry was off-site (page 8). Nearly half the on-the-job trainees were in apprenticeships, with very high proportions among tool-and-die makers, plumbers and pipefitters, electricians, and millwrights (page 9).

From these diverse surveys, made at different times and including a range of size classes, a hazy picture emerges: formal training is provided by a good deal less than half of all firms, but by more than 8 out of 10 larger firms (500 employees or more); and the number of workers involved in training in any one year amounts to about one in five in large firms, and a smaller proportion in all industry. Training is mostly given in company-sponsored courses during working hours. Training for skill development (as distinct from orientation, the firm's organization, safety, etc.) is only a part of the total. Much of the formal skill training is for management or other white collar skills; manual workers get a disproportionately small share of formal training.

C. Training As Seen by Workers

Turning to a view of training from the workers' vantage point, our best source is a 1963 survey of a sample of the adult working population--persons aged 22-64 in the labor force, 82 percent of whom responded either to the original survey or to a follow-up interview (U.S. Department of Labor, Manpower Administration, 1964). In the analysis of this survey the 14 percent of workers who had 3 or more years of college were treated separately. The remaining 86 percent included 39 percent who had received formal training and 47 percent who had not. Thus, including those with 3 or more years of college, just over half the adult workforce had received some formal

training for work in the course of their lives. (This cross-section of the entire work force in 1963 shows a lower percent with formal training than Table 1 above implies for new workers coming out in 1976.)

Those whose education amounted to less than 3 years of college were asked what training programs they had completed. Company courses were reported by 6.6 percent (7.5 percent of the men, 4.9 percent of the women) and apprenticeships by 8.2 percent, mostly men (Table 4 of the report). These workers were also asked about training they had received for their present jobs (or last jobs if they were unemployed). Some formal training (including school, apprenticeship, or company courses lasting 6 or more weeks full-time) was reported by 30 percent. On-the-job training (including shorter company courses) was reported by 56 percent, and 45 percent said they learned by casual methods, such as "picking the job up," or "friends or relatives." (Since many used more than one method, the total exceeds 100 percent.) Interestingly, 7.5 percent said no training was needed for their jobs; these included some in each major occupation group, and significant proportions among laborers, farm laborers, and service workers. Formal learning was reported by large proportions of professional and technical, clerical, craft, and managerial workers. On-the-job learning was reported by well over half of the workers in all occupations except farm workers, laborers, and service workers, for whom casual methods of learning were more common (Table 3).

When the workers were asked which of the ways they learned their present jobs was <u>most helpful</u>, school (including company courses of 6 or more weeks, full-time) was named by only 9 percent (Table 3). On-the-job instruction was reported as most helpful by the largest proportion, 30 percent, and 20 percent owed the most to just picking up the job. Shorter

Table 3 - All Ways and Most Helpful Way of Learning Current Job[1] By Occupation, April 1963

Percent distribution of civilian workers 22 - 64 years old who had completed less than 3 years of college

Ways of Learning Current Job	All Occupations	Professional, Technical	Managerial	Clerical	Sales	Crafts	Operatives	Laborers	Service		Farm	
									Private Households	Other Service	Farmers	Farm Laborers
Total in Occupation	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
No Training Needed	7.5	2.1	4.0	2.0	7.5	1.8	8.6	18.1	27.9	13.5	8.4	17.7
All Ways of Learning the Job[2]												
Formal Training[3]	30.2	64.6	36.2	53.6	23.4	40.6	12.9	6.9	10.3	24.6	20.6	11.1
On-the-Job Learning	56.2	66.7	57.1	71.4	60.2	64.8	61.8	40.0	9.3	45.5	17.6	19.2
Casual Methods	45.4	33.2	55.1	29.5	47.4	47.5	42.6	50.5	56.4	42.7	79.7	64.8
Not Available	1.6	1.2	1.2	.7	1.0	.8	1.2	2.3	5.5	2.3	4.0	5.4
Most Helpful Way of Learning the Job												
Formal: School[3]	8.7	25.2	7.8	21.7	5.1	6.0	2.8	1.7	4.4	10.6	3.4	2.6
Apprenticeship	2.0	2.0	1.6	.2	.2	8.3	.9	.4	—	.7	.1	.2
Armed Forces	1.2	2.5	1.8	.4	.4	2.4	.8	.9	.7	1.1	.6	.4
On-the-Job Instruction	29.6	24.9	20.8	37.9	30.8	27.6	41.4	26.6	4.8	25.9	7.3	13.2
Company Training Course[4]	3.6	4.3	3.3	4.1	8.2	3.9	3.8	1.2	.1	4.0	.3	.2
Worked Way Up	3.9	5.7	9.2	4.9	4.2	5.5	2.3	1.8	.5	1.4	.4	.3
Casual: Friend or Relative	6.0	2.3	8.5	1.6	3.5	6.2	4.4	5.1	13.9	4.3	30.5	13.5
Picked it Up	20.4	6.4	24.0	9.9	23.8	17.9	22.1	31.4	31.9	23.7	23.9	30.4
Other	2.5	8.7	3.3	1.9	3.5	1.6	1.3	1.4	2.5	2.2	5.8	4.7
Not Available	14.6	16.0	15.7	15.3	12.7	18.9	11.6	11.3	27.9	13.5	19.2	16.9

1/ Last job if unemployed.
2/ Sum exceeds 100 percent since some reported more than one way.
3/ Includes company training school if training was full-time for 6 weeks or more.
4/ Part-time or less than 6 weeks.

Source: U.S. Department of Labor, Manpower Administration, 1964, Table 11

or part-time company training courses were named by 8 percent of sales workers but by 3 to 4 percent in every other group except farm and service workers.

The skill acquisition experiences of the occupational groups differ markedly. Among professional and technical workers, school and on-the-job instruction were each reported as most helpful by one-quarter of the workers. Only 8 percent of managerial workers credited school, and 3 percent shorter company courses, as most helpful, despite the heavy emphasis on managerial courses in industry's training activity; 24 percent said picking the job up had been their best way, 21 percent credited on-the-job instruction, and 9 percent had worked their way up. On-the-job instruction was most helpful to 38 percent of clerical workers, and school for 22 percent. Sales workers--another group for which industry provides much training--credited on-the-job instruction and picking the job up as most helpful; only 13 percent indicated school or company training. Among craftsmen, apprenticeship was given major credit by only 8 percent, on-the-job instruction by 28 percent, and picking it up by 18 percent. Operatives indicated a similar emphasis.

In summary, among the 84 percent of workers with less education than three years of college, informal methods (including instruction on the job, working one's way up, and casual methods) were the most important ways of skill acquisition for 62 percent, and company-provided training, including apprenticeship, for only 6 percent. (To this should be added a number, probably small, who benefited by longer company courses.) This conclusion must be tempered by recognition that it is based on memory as well as subjective judgments about the value of different phases of workers' experience; moreover it includes both the experience of older workers who had acquired their skills many years earlier, as well as that of young

workers who had not yet completed the process of skill development.

D. Cost of Training

Estimates of how much is spent on training by employers vary widely. One reason for this is the paucity of cost records; no more than 10 percent of the metalworking plants surveyed by the Bureau of Labor Statistics could identify even the direct costs of training (BLS, 1974, p. 21). Another reason is that while tuition payments, salaries of trainers, costs of books, supplies and training materials, and other direct costs can be recorded, the overhead allocatable to training (cost of training space in the plant, heat, light, etc.) and the salaries of employees paid while taking training during working hours are more difficult to account for. Yet if industry really wanted the cost information, it should be able to get it.

One enthusiast has estimated total costs of employer-provided training in the United States (including those provided to government employees) as $100 billion in 1975 (Gilbert, 1976). This calculation was made by bold extrapolation from small bits of evidence and implies that training costs amounted to about 12 percent of all wage and salary payments in that year, a staggering conclusion.

More modest, though crude, estimates may be developed from the Conference Board survey of training in large firms. Direct costs (excluding overhead and salaries of trainees) were estimated at about $2 billion in the large firms surveyed, which represented about half of all private nonfarm wage and salary employees in 1974 (Lusterman, p. 12). Since smaller firms do less training than large, direct training costs in the rest of the private economy might add $1 billion to the total. The salary cost for trainees may be estimated very crudely if we make several assumptions: (a) that

since about 1 in 5 employees in large firms participate in training during a year, 1 in 10 in small firms may do so - or an average of 15 percent in the entire private economy; (b) that the average duration of training is one week (only 30 percent of companies providing company courses during hours, the most prevalent form of training in terms of number of workers involved, gave courses amounting to 30 or more hours of training, according to Lusterman, Table 6.1). Taking 1/52 of the annual salary for 15 percent of all workers in the private economy and applying this to total wage and salary payments in the private economy, which amounted to about $604 billion in 1974, we get about $2 billion in salary costs of trainees to add to the $3 billion in direct costs. After allowance for overhead costs and for somewhat higher-than-average annual salaries of the managerial and professional workers who receive most of the training, we may estimate a total training cost closer to $10 billion than to $100 billion, or closer to 1 percent of the wage bill than to 12 percent.

There is great variation among companies in the training cost per capita of their employees. The average (mean) direct cost* for the large companies included in the Conference Board survey was $60 annually per employee (based on their total employment). The median cost per employee was $16; the very large difference between mean and median reflects the "upward pull on the mean of a small number of high-spending companies" (Lusterman, p. 12). Firms with 10,000 or more employees spent a mean per employee of $86, while the smallest size firms (with 500-999 employees) spent $27 (page 13). Transportation, communications, and utilities and

*Defined in the questionnaire as: "salaries of employees devoting all or major portions of their time to these activities; travel and living expenses; payments to outside institutions or individual contractors; and costs of equipment and material purchased or rented."

financial and insurance firms spent more than the average ($90 and $82 per employee, respectively), while firms in wholesale and retail trade averaged only $19 (Lusterman, Table 2.8).

The $60 average for large firms may be compared with the average annual wage and salary payment in private nonfarm industry, which was $9919 (full-time equivalent in 1974, as compiled by the Commerce Department and published in the Survey of Current Business). Large firms, whose wages per employee probably were higher than this average, paid less than 1 percent of their payroll cost for direct training expenditures, and probably less than 2 percent when all costs of training, including trainees' salaries, are taken into account.

Since about 1 in 5 employees in these large firms receives training each year on the average, the $60 average for all employees comes to about $300 per employee receiving training, exclusive of the employee's salary while in training (if training is during hours) and an allowance for overhead if the training is given on company premises.

The most "gung-ho" of all companies in terms of training is the Bell System, which says it spends over $1 billion a year (including salaries of trainees), or an average of over $1,000 for each of its nearly 1 million employees. As an illustration, nearly all the 825,000 employees in the 19 operating telephone companies, the long lines department, and the AT&T general departments staff receive some formal training or educational experience in the course of two years - a participation rate of 50 percent per year. This amounts to 2½ million student days of training per year, an average of 6 days per employee being trained. These 6 days cost over $2,000 or an average of more than $333 per day, including trainees' salary

(which, on the average, is probably less than $100 per day).* One-fifth of the billion-dollar training budget goes for development of training programs and methods, research on training, and management and control of the training function (Blount, pp. 4-6); most of these activities are not attempted by smaller companies engaged in training. The Bell System training program makes limited use of tuition aid and relies heavily on internally developed courses (Luxenberg, pp. 33-34). It would appear that the Bell System training budget is in the neighborhood of 5 percent of its total wage and salary bill.

This wholehearted dedication to training is far from typical of American companies, as is apparent from the estimates of training expenditures suggested above. It is noteworthy that at a time when concern about declining rates of productivity growth is so general, so little is done to enhance the productivity growth of the workforce through training. Is it possible that industrial management has little faith in the enhancement of productivity through training?

The paucity of records on the cost of training - particularly the less-formal modes - leads one observer to comment: "This leads one to view with considerable skepticism programs designed to subsidize training or to insure employers against the risk of higher training costs associated with the employment of disadvantaged groups. Such programs attempt to provide a cost incentive for management to train when it does not view training as a cost item " (Piore, Manpower Administration Research Monograph No. 7, p. 14).

---

*Full-time equivalent average wage and salary per employee in the telephone and telegraph communications industry was $18,555 in 1978, according to the Department of Commerce, or an average of $71 per day. Those receiving training may average a little higher.

IV. NEW CHALLENGES FOR TRAINING

Beyond its normal tasks of qualifying new workers for their first jobs in the company and preparing workers in the firm for advancement, company-provided training faces new challenges in the immediate years ahead. One of these is combatting the decline in productivity growth that has manifested itself for the past 15 years. A second is providing for changing skill needs in the workforce of many industries. A third is in taking on the extra task of aiding in affirmative action programs to combat the residual effects of a century of discrimination in employment on the basis of race and sex. A final challenge to industry is internal: to look at itself and find practical ways of evaluating the effectiveness of training in general as well as determining the most effective methods by which to train.

A. Training for Productivity Growth

The slowdown in productivity growth in the United States since the mid-sixties has been a dark cloud overhanging the economy and has contributed to inflation, the declining exchange value of the dollar, and a deepening crisis in social relations as rising expectations crunch against more rigidly limited potentialities.

From 1950 through 1965, output per hour in the private business sector of the economy rose at a rate of 3 percent annually, permitting a steady increase in average real wages. Since 1965 it has increased at an average rate of only 1.7 percent (calculated from data regularly published in the Monthly Labor Review).

Among the factors that have been adduced to explain this drop have been the substantial ending of the historical shift of employment from low-

productivity work in agriculture to higher-productivity jobs in nonfarm industry, and additional employment shift effects in mining, manufacturing, utilities, and finance; the increasing proportion of new, unskilled workers in the labor force resulting from high births in the early 1950's and the influx of women into the labor market; the decline in the growth of the amount of capital equipment per worker; the diversion of investment and labor to pollution-control equipment and worker safety measures; and the effects of the business downturns in 1969-70 and 1974-75 (Mark, Kutscher, and Norsworthy, in National Center for Productivity and Quality of Working Life, 1977, pp. 9-16).

Some of these factors will continue to operate, and there is no way that training can have an impact upon them. However training can help to redress the effects of the decline in quality of the labor force, not only by enhancing the skills of the new workers but also by general upgrading and sharpening of skills and efficiency, including managerial and technical skills which potentially have a broad effect on the efficiency with which industry operates.

The effect of training on productivity has not, it is fair to say, been established empirically in a clear and incontrovertible manner. There is evidence that productivity is related to rising educational levels. For example, Edward Denison estimates that from 1929 to 1969, the rise in the educational attainment of employed workers contributed about 0.5 percent to the average annual increase of 2.22 percent in the "sector potential national income per person potentially employed" - his measure of productivity in the economy abstracted from the effects of the business cycle. Thus, rising educational attainment contributed between a fifth and a quarter of the total productivity increase. The calculation was based on the massive

increase in the proportion of workers who had completed high school and college, and the longer school years when they were students, and Denison used earnings differentials by level of education as a measure of the marginal productivity of the workers (Denison, in National Center for Productivity and Quality of Working Life, 1977, pp. 21-24).

It is plausible that if general education contributes so significantly to rising output per worker, training that enhances work skills must also contribute, even if the contribution cannot be measured by the available statistics.

Attempts to measure the effectiveness of training in increasing productivity have run into difficulties for a variety of reasons. A major problem is finding a way to measure the individual's productivity or job performance. For most jobs there is no simple measure of performance, such as units produced per hour; instead researchers have to fall back on supervisors' ratings of employee performance, or earnings, or rates of promotion - each of which has its deficiencies, including lack of objectivity or being affected by factors other than work performance. A second problem is identifying the effect of training on performance, separately from the effects of other factors, including both the inherent differences in capability, motivation, or drive among individuals and a host of factors in the work situation.

An illustration of the difficulties is afforded by a recent study of the effect of continuing education on the job performance of engineers (Morris, 1979). Three measures of work performance were used: earnings, number of persons supervised, and supervisors' ratings. The amount and kind of continuing education received were measured by the number of hours in technical courses, business courses, and other courses, as well as the

combined total. The differences among engineers in ability and educational background before they took the continuing education were controlled for eight variables measuring school achievement, supervisors' ratings, and academic honors. Other variables that had to be controlled for included length of professional experience and "drive," the latter being based on supervisors' judgments. The findings of the survey showed a consistent "weak to moderate" positive relationship between continuing education and earnings. What is still undetermined is whether the more capable or motivated performers tended to take continuing education - i.e., which was cause and which was effect. The effects of variables measuring differences in ability and educational background were examined, but the variables available do not clearly measure innate ability, and the hypothesis that the more able took more continuing education cannot be ruled out.

In view of the difficulty in measuring the effectiveness of training in raising productivity, we find ourselves forced to take the value of training on faith, and indeed this has been the major underpinning of training over the years. Perhaps more than about 1 percent of the wage bill might be budgeted for training if there were better evidence of its value, since even a small additional increment in productivity would have an immense payoff.

B. Training for Changing Skill Needs

The growth of the economy, and especially the faster-growing sectors, imposes substantial burdens on the skill development system and on training provided by industry. This is partly because changes in employment patterns may proceed faster than the tradition-based skill development mechanisms are prepared to cope with. Unless education and training programs are adjusted flexibly to the changing needs, there will be shortages of trained

workers in the faster-growing fields. As we observed above, the final step in the skill development process - the step that has to make up for the deficiencies of the others - is training within industry.

Education and training in occupational skills has to provide not only for the growth in demand for the various occupations that accompanies economic growth and change but also for replacement of workers who leave occupations because of retirement, death, withdrawal from the labor force before retirement (as in the case of women leaving to keep house), or shifting to other occupations. To illustrate the importance of this replacement need, we may cite the most recently published projections of the Bureau of Labor Statistics, those for the period 1976 to 1985 (Bureau of Labor Statistics, Bulletin 2020, 1979). In this nine-year period, 16.8 million job openings are projected in all occupations to provide for their growth, and nearly twice this number, 29.1 million additional openings, will occur as a result of replacement. Moreover, the latter estimate does not account for openings arising as workers shift to other occupations. The total of 45.9 million job openings, or an average of 5.1 million a year, is therefore a minimal estimate of the number of persons who will have to acquire work skills. The occupational distribution of these is shown in the following table (ibid., p. 6):

	Average annual job openings (000)
Total, all occupations	5,100
White-collar workers, total	2,750
Professional and technical workers	710
Managers and administrators	600
Sales workers	330
Clerical workers	1,110
Blue-collar workers, total	1,430
Craft and kindred workers	610

Average annual job openings (000), cont'd

Operatives	640
Nonfarm laborers	180
Service workers, total	900
Private household workers	50
Other service workers	850
Farm workers	20

Even allowing for the fact that some occupations, such as private household and farm workers, do not typically acquire skills by employer-provided training, it is apparent that the skill development task (especially when occupational shifting is allowed for) will involve 5 million or more workers. It exceeds the average size of the age cohort of the population reaching working age annually in this period, which is about 4.3 million, not all of whom enter the labor force.

We can least securely rely upon existing skill development mechanisms to perform adequately when the growth rate of demand for the occupation is significantly above average growth rates. The BLS report identified 73 occupations in which growth rates will be 50 percent or more above the average growth rate of 19 percent in this 9-year period; in half of these the growth rate is projected to be at least twice the average. A list of these very rapidly growing occupations follows:

Bank Officers and Managers
Urban Planners
Police Officers
Teacher Aides
Sewage Plant Operators
Cement Masons and Terrazzo Workers
Insulation Workers
Ironworkers and Riggers
Operating Engineers
Plumbers and Pipefitters
Roofers
Flight Attendants
Geologists
Geophysicists
Surveyors
Airconditioning, Refrigeration, and Heating Mechanics
Business Machine Repairers
Computer Service Technicians
Industrial Machinery Repairers
Dental Assistants
Dental Hygienists
Dental Laboratory Technicians
Physicians
Emergency Medical Technicians
Medical Laboratory Technicians
Medical Record Technicians and Clerks
Radiologic Technologists
Respiratory Therapy Workers
Licensed Practical Nurses
Occupational Therapists
Occupational Therapy Assistants
Physical Therapists
Physical Therapy Assistants and

Aides
Speech Pathologists and Audiologists
Dispensing Opticians
Health Services Administrators
Homemaker - home health aides
Floral Designers

It can be seen that these occupations are of all kinds, including many health-related fields, repair and maintenance mechanics, professional, managerial, and clerical occupations. The training needs differ widely; for some, relatively little on-the-job training is customarily given. These high-growth occupations should not be seen as a list on which to concentrate attention in planning training - for in many other slower-growth occupations larger numbers will have to be trained - but rather as a list of potential danger spots to keep an eye on and make sure that training resources are adequately expanded.

C. Training in Aid of Affirmative Action

Another new responsibility for training is to aid in affirmative action programs to offset the disadvantages in employment suffered by minority groups and women as a result of past discrimination. The earliest efforts of industry to employ these disadvantaged groups in larger numbers ran head-on into their lack of qualifications. Few of the disadvantaged had taken training for the better-paying, higher-skilled occupations in school because they knew they would not be able to find jobs. As a result, when the jobs did open up, they had not the skills. Minority and women workers in industry had been shunted to low-grade, often dead-end jobs, and there they sat. The answer, therefore, was training within industry; it became necessary to set up training opportunities within the plant open to these workers, to encourage them to take the training, and to make sure that the training was adapted to their backgrounds and made up for the deficiencies in their education and skills that had resulted from past discrimination.

Where training already existed, questions of the rights of various employees to admission arose, as well as the need to adapt the programs to the special needs of minority groups or women trainees where such needs were evident.

The Civil Rights Act of 1964, under which the Equal Employment Opportunity Commission operates, does not require training where none now exists. It does try to assure that admission to training is governed by the protections of equal employment opportunity standards. Voluntary action by employers and unions is encouraged where past practices (that were not illegal at the time) have created an adverse impact on the employment opportunities of any group. Where the available labor pool of minorities or women for employment or promotional opportunities is limited because of historic restriction by employers, labor organizations, or others, the Guidelines issued by the Commission encourage employers to take affirmative action, including establishing

> training plans and programs, including on-the-job training, which emphasizes providing minorities and women with the opportunity, skill and experience necessary to perform the functions of skilled trades, crafts, or professions (Equal Employment Opportunity Commission, Affirmative Action Guidelines, Sec. 1608.3, Federal Register, January 19, 1979, Part XI, p. 4427).

D. Evaluation of Training

It should be apparent from some of what has been said above that there are questions as to the value or effectiveness of training; industry is not sold on it unanimously. Part of the reason for this must surely be the lack of clear measures of its value, or, more precisely, the ratio of its benefits to its costs.

There are two ways in which evaluation of costs and benefits would be helpful: first, in determining whether to provide training in a specific

company and in specific skills within that company at a point in time; second, in determining which of various alternative methods of training in specific skills is likely to be the most effective in view of the costs. The second is a valid question to ask even if the question of whether to train at all is decided as an act of faith. Even if training directors no longer have to justify their existence in the company they must ask themselves how to provide the best training for the company's dollar in each instance.

Some of the difficulties involved in evaluation research are touched on above in the discussion of productivity. In addition to those, one should mention the problem of control groups: the difficulty of finding a group of workers, similar in every critical respect to those receiving the training, who do not get training, so that differences in performance between them and the group receiving training can be attributed to the effect of training. Control groups of rats in a laboratory do not feel discriminated against, do not file grievances, nor go on strike; no one considers that they have to be treated like human beings.

With this as background, the lack of evaluation of training within industry is understandable. Clark and Davis (1975) report:

> Surprisingly little progress has been made toward developing techniques for comparing the benefits of training with its cost. While many studies have shown the returns to investments in formal schooling, a survey of 100 large corporations by the authors turned up no instances (among the 50 replies received as this chapter is written) of business being able to gauge the returns to investments in training with the same financial analysis that it uses before deciding to build a new plant or when choosing between alternative pieces of equipment. While some companies may be conducting formal financial analysis of their training, our findings reveal that business, in general, lacks sophisticated guidance in cost-effectiveness analysis (p. 186).

These authors report that management is pushing training staffs to provide justification, thereby stimulating evaluation of some sort, much of it subjective. Trainees are asked if they found the training worthwhile. Supervisors' opinions are sought. Salesmen's sales records before and after training are compared (a more objective method, but certainly an outcome that may reflect causes other than training). The same comment may be made about comparing turnover before and after training, rates of promotion, and other benefits.

A sounder evaluation approach might be to build evaluation into the way the training program is conducted, such as using control groups in different plants or departments and keeping adequate records. One suggestion by Clark and Davis (p. 187) is that the profit centers in a company be required to buy their training from the training department, rather than get it as a free service. This might result in the buyers being more critical and more demanding; and the training would no longer need to be justified to the company. It is not likely that many training directors would agree to this system.

There is room for progress here, and perhaps some is being made. The Bell System has a research project to measure performance (the critical variable for evaluation research) - in this case managerial performance (Robert L. Craig, American Society for Training and Development, in an interview, July, 1979). With large firms that invest so much in training leading the way in evaluation research, it may be hoped that methods will be developed and that evaluation will become a common tool to improve training.

V. THE ROLE OF GOVERNMENT IN SUPPORTING TRAINING PROVIDED BY EMPLOYERS

What role, if any, should government take with respect to this internal activity of business firms? Although the federal government now subsidizes training within industry, this is still a controversial issue, not only as to whether support should be given but also as to the extent, the kinds of situations in which support is justified, and the methods by which it is furnished.

That the government has legitimate interests in stimulating training is not questioned. The government has an interest in helping to raise productivity, in order to reduce inflationary pressures, maintain competitiveness of American industry in world markets, and assure rising levels of per capita income. It has an interest in whatever contributes to affirmative action for equal employment opportunity, to assure equal treatment of citizens. It also has an interest in helping in the employment of disadvantaged workers who are unemployed because of lack of skills, not only to enhance their income and sense of independence but also to get them off welfare and other transfer payment programs. A social contribution to training might offset the costs of these programs.

Industry's attitude has been mixed. Some firms prefer to do their own thing: to give training as they see they need to. They are loath to lose control of training, especially to unions. This motive underlies the reluctance of many firms that run apprenticeship programs to register them with State Apprenticeship Councils or the Bureau of Apprenticeship and Training of the Department of Labor. Individual employers, especially small ones, do not give formal training because of their inability to hire training staff or find enough workers needing to learn a particular occupation

to make setting up a training program worthwhile; they do not welcome attempts to push them into this activity.

Yet there is support among some business groups for government intervention. The Committee for Economic Development, a "liberal" business organization representing mostly large firms, in a statement by its Research and Policy Committee, supports increased financial incentives for apprenticeship programs, primarily in the form of stipends, and experimentation with training vouchers for apprenticeship and other skill-training programs, to preserve some marketplace automatic controls by giving trainees a chance to shop around for the best available training opportunities (CED, 1978, p. 67).

Government could promote training provided by industry by methods short of financial support, by technical aid and related services. It now gives this kind of assistance for one form of training, apprenticeship, and could extend it to others. (The Bureau of Apprenticeship and Training in the Department of Labor was created out of an earlier agency focusing on apprenticeship alone, with the purpose of broadening its technical, statistical, standard-setting, and promotional functions to other types of on-the-job training, but the agency never made the metamorphosis expected: out of the chrysalis came the same caterpillar that went in.) The technical assistance could include advising firms, especially small ones that cannot afford to employ training staff, on how to assess their needs for training, and on the best ways to provide it, including using resources outside the firm, such as schools and private firms that provide training services. The United Kingdom has developed such advisory services, which have proven helpful to small firms. Statistical services would contribute to better planning of training assistance; they should include regular collection of

data on the nature and extent of training being given. Finally, technical assistance could include development of research methods for evaluating the effectiveness of training, and building the necessary record-keeping into the system.

Financial support for training is more controversial. Economists have approached government subsidy for this, as for other "internal" activities which industry has traditionally done by itself, with some skepticism: "A subsidy is guilty until proven innocent" (Mangum, 1968, p. 7; see also Lebergott, 1978). It is argued that government should not subsidize training that is specific to the firm and of no use to the worker in any other job, since it does not promote employability. "General" training (in Becker's sense), on the other hand, is theoretically paid for by the employee through a wage below his marginal productivity level, and the employer should receive no subsidy for what he does not pay for.

Nevertheless, it is conceded, there is a social benefit in some cases above the benefit to employers and workers. Examples of cases that justify government subsidy to employers for training include workers whose productivity is so low, because of lack of work skills, that if they paid the cost of their general training, their wage rates would be below the legal minimum, or so low that they would offer the worker little incentive to get off welfare or other transfer payments. Careful examination is urged "to assure that the social benefits in excess of private benefits actually exist" (Mangum, ibid., p. 13).

Strong support for federal aid was voiced by the Task Force on Occupational Training in Industry, composed of industry, union, and public representatives, in its 1968 report, A Government Commitment to Occupational

Training in Industry. The report recommended a National Training Act as the charter for a national planned program of "levels of training adequate to meet the nation's economic, social and security needs." Federal support was recommended only for (1) "an identifiable program" of training and related services for the unemployed, underemployed, disadvantaged, handicapped, and new entrants into the labor force (not a very narrow limitation); (2) training supervisors to deal with problems of the disadvantaged; (3) helping small firms to train; (4) supporting training by firms or organizations beyond their own manpower needs for the general job market in specific areas of federal interest; (5) training by hospitals and other nonprofit services where passing on the cost of training to the consumer would be socially undesirable; and (6) training in shortage occupations (ibid., p. 8). Employers training the disadvantaged under existing legislation (MDTA) were to be reimbursed only for the extra cost and risk involved, above the costs customarily incurred in training a new employee (ibid., p. 10).

The task force put forth one new justification for government support: training provided by an employer may be an effective substitute, at lower cost, than other forms of training now provided at public expense (ibid., p. 75). Broadly interpreted, this could refer to public vocational education in secondary schools as well as that financed by income transfer programs.

The issue is not merely theoretical, since there has been federal support for on-the-job training for 17 years, first under the Manpower Development and Training Act of 1962, and currently under the Comprehensive Employment and Training Act of 1973, most recently amended in 1978. In the first ten years of the MDTA program, 1.9 million persons were enrolled in training - two-thirds in schools and other institutional training and one-third in on-the-job training. More recently the proportion in private industry

on-the-job training has been reduced, partly because a larger proportion of the funds are going to public service employment, which is supposed to include training (Employment and Training Report of the President, 1978, p. 307).

One of the chief mechanisms for promoting employment and training of the disadvantaged, the unemployed who lacked marketable skills, has been the NAB/JOBS program (National Alliance of Business/Job Opportunities in the Business Sector, if one prefers the stodgy name to the snappy acronym). This organization, begun in 1968 and led by businessmen, attempted to gain the support of industry for employment of the disadvantaged by soliciting pledges of jobs. It promised more than it delivered, according to the Director of the National Commission for Manpower Policy, and in recent years only 2.5 percent of CETA spending has been devoted to on-the-job training (Isabel V. Sawhill, quoted in National Commission for Manpower Policy, Report No. 8, December 1978, p. 110).

Evaluations of the 17-year experience in supporting training are mixed, reflecting the various forms the federal on-the-job training programs took and the wide variety of circumstances, client groups, employers, and sponsors (Perry, et al., 1975; Myers, 1971; Mangum and Walsh, 1973; National Commission for Manpower Policy, 1978). In some cases high rates of successful outcomes were achieved by selecting the most able and employable workers for the programs to begin with - "creaming," in the jargon that has developed around the administration of this legislation. In other cases, employers provided for "training" only low-wage, high-turnover jobs they could fill in no other way, with the results that might have been expected.

Compared to the other major type of training provided under the government programs, training in schools or other institutions, on-the-job training is shown by evaluation studies to have been far more cost-effective.

Cost-benefit ratios of over three to one are reported. The ratios depend on assumptions as to how long the benefits will endure through the worker's subsequent work-life; if five years is assumed, instead of ten, for example, the training, especially institutional training with lower cost-benefit ratios, is open to serious challenge (Perry, et al., pp. 158-159). (These estimates do not include non-earnings benefits, such as a reduction in unemployment insurance or welfare costs.)

The institutional and on-the-job training should not, however, be compared as if they were alternative methods of accomplishing the same purpose; they really serve different ends. Institutional training is more appropriate for occupations with a high theoretical content, where the worker must have a great deal of training before he can be productive, or where safety is a consideration. On-the-job training is best for more practical skills, not easy to teach in a school, and where the worker can be productive quickly. It is also cheaper, and, from the worker's point of view, attractive because it involves being in a job with a hope of continuity and receiving a wage.

In summary, subsidized on-the-job training, despite some ambiguous evaluation results, has helped to get long-term unemployed workers (structurally unemployed and disadvantaged workers) into jobs and has succeeded in part because it is inextricably associated with employment programs.

There are serious questions about the best method for providing a subsidy. Supplements to wages have been one method, tax credits another, and each has its advantages and problems. In addition a levy-grant system has been used in the United Kingdom.

An illustration of the former is the on-the-job training subsidies under MDTA, which were a fixed weekly amount for a maximum number of weeks -

for example $25 a week for a maximum of 26 weeks, a total of $650 per worker. The subsidy was supposed to pay the training cost to the employer. The worker received a wage. In the NAB/JOBS program, which concentrated on employment of disadvantaged workers, the subsidy was $3000 per worker. Nevertheless, most employers able to choose between ordinary on-the-job training under MDTA and NAB/JOBS participation preferred on-the-job training even with its lower subsidy, because they felt they got higher quality workers (Mangum and Walsh, op. cit., p. 135).

The direct subsidy focuses attention on the amount of the subsidy in relation to the productivity of the worker. It gives the local sponsoring agency some control over the program. Tax credits are preferred by employers, however, because they involve less paperwork and because the employer can get the benefits by exercising his own initiative, i.e., in the course of filling out his own annual income tax return instead of waiting for a government agency to process the payment.

The Task Force on Occupational Training in Industry recommended that direct subsidies, rather than tax credits be used, because they saw the need to focus aid for training on disadvantaged workers, shortage occupations, and problem areas (such as small firms) and did not want to justify federal support for generalized training throughout the economy (ibid., pp. 79-80). The Treasury Department opposed a tax credit, wishing to avoid having to evaluate training programs for eligibility (something that could be avoided by having a training agency certify programs before they were eligible for tax credits), on the grounds that tax legislation is revised infrequently while direct subsidy legislation is usually written for a few years at a time, and on the grounds that the tax laws should not be used to achieve social objectives (a startling philosophical departure) (ibid., pp. 80-81).

Some members of the Task Force entered minority opinions in favor of the tax credit approach.

The levy-grant system involves imposing a levy on all firms in an industry in which a training board is set up and rebating the funds to firms that engage in approved training. This pools training costs among firms, so that those who get their skilled workers by hiring them away from others instead of training, including small firms which cannot afford to set up training, will pay their share. The Task Force saw administrative problems in this system, and did not recommend it for the United States, but suggested that industries and unions try it on a voluntary basis.

Despite the concerns about tax credits, the appeal of this device to business firms - who must be depended on for employment and training in the private sector - and the limited results of direct subsidy over the years contributed to the passage of a Targeted Jobs Tax Credit in the Revenue Act of 1978. Employers are eligible for tax credits of half the wage, up to $3,000 in the first year and up to $1,500 the second year of employment, for hiring disadvantaged workers in certain target groups: welfare recipients, the handicapped, youth and Vietnam veterans from poor families, ex-convicts, and participants in cooperative education. The individuals must be certified as eligible by a designated local public agency. The National Commission for Manpower Policy, torn between its hope that business would take advantage of this provision to hire more disadvantaged workers and its fear that business would take advantage of this provision, period, recommended that "The Secretary of the Treasury, in drafting the regulations for a new Targeted Jobs Tax Credit, seek a balance between the objective of reducing unintended uses of the funds by private employers and encouraging

more of them to participate in hiring the structurally unemployed" (National Commission for Manpower Policy, December, 1978, p. 2).

In the 1978 amendments to CETA, a new Title VII provided for the establishment of Private Industry Councils by local private sponsors (agencies of state and local governments responsible for operating CETA programs). The Councils, composed primarily of business representatives, would be responsible for developing, and in some cases operating, programs to train and hire the structurally unemployed and for advising the prime sponsors on other aspects of their programs.

It is too early to evaluate the effectiveness of these two new programs. Like those that preceded them, they attempt to accomplish a difficult task - building the skills and employability of the least-advantaged persons in society by gaining the cooperation of industry. To do this, they, as was true in the earlier programs, use some cajolery and some financial incentives, but in doing so try to walk the fine line between giving away too much and loading the program down with so many controls to protect the workers and the public interest that business cooperation is lost.

The experience to date in the United States is not without its successes, but it is certainly not one that clearly points the way to the "right" program.

VI. RECOMMENDATIONS

A. Data Collection

A striking fact emerging from this study is that it is difficult to put together a coherent picture of employer-provided training in the United States from recent surveys. Although each survey breaks new ground and provides important insights, some of the essential questions are not answered. With the benefit of hindsight, a few recommendations are offered for future surveys of training - recommendations so elementary that they are made only because recent surveys have ignored them:

(1) Standard survey practices should be followed with respect to surveying a sample of nonrespondents and drawing inferences about the major characteristics of the entire population.

(2) Tabulations should be designed to show what number or percent of firms give any formal training, as well as the number that give each type of training.

(3) All major tabulations should show not only the number of firms but also the number of their employees and the number of workers receiving training in the course of a year or other period of time. This is the only significant way to weight the relative importance or incidence of training. The figures on trainees should be compared to total employment in the firms so that the percentage of workers receiving training is shown.

(4) The tabulations should show what occupations or occupation groups workers given training are in, and/or what they are being trained for, as a percentage of the totals employed in these occupations.

(5) The purposes of training should be shown, under such major categories as qualification for employment, skill improvement or upgrading, retraining, safety, etc.

(6) Training modes should be shown, under such major categories as: on the production site; off-site; company-provided or provided by an outside institution or school; company financial contribution, if the latter.

(7) Significant breakdowns of the above information should include industry, size of firm or establishment, and perhaps location.

(8) Surveys of groups of workers or of a sample of the population should be made to get a different insight into the incidence of training, sequences or combinations of education and training, and demographic characteristics such as age, sex, and race. Age is particularly important, not only because education and training patterns have changed over time, but also because older workers have had more exposure to whatever training was around.

B. Technical Aid to Training

Small employers should be given technical aid to help them in identifying their training needs, in locating good sources of training for their various occupations in the community, or in providing training within the company for small numbers of workers at reasonable cost. Universities and colleges, technical institutes and community colleges, proprietary schools, audio-visual aids, and programmed teaching methods are available, but the small employers need expert guidance in selecting among them the training best suited for their occupations and their particular workers. Institutions in a community may be stimulated to provide courses if someone identifies a need on the part of a number of small firms.

There should be in each community or at the state level a technical aid agency for training to provide this assistance to industry on request. The federal government should play a role in funding this service, but state governments and industry groups should also contribute, the first by federal-state matching grants, the second by fees for service. It is important that business firms be more than passive recipients of technical aid; they should help to generate it and to pay for it.

If this service is set up as part of the Employment and Training Administration and its affiliated state agencies, it should be isolated sufficiently from other operations of the state employment security agencies so that the workload pressures of other programs do not swamp the training

service, as has frequently happened to other services provided by the employment security system.

Other technical aid should include a regular program of surveys of training activity and of research on evaluation methods. Surveys of a sample of employers every few years might be accomplished through the federal-state cooperative occupation employment statistics program conducted under the direction of the Bureau of Labor Statistics. Less frequent surveys of a sample of workers could be made through the mechanism of the Current Population Survey. Evaluation research can draw on the experience in evaluating training under MDTA and CETA.

C. Financial Aid

It is more than a decade since the report of the Task Force on Occupational Training in Industry, and in addition there are 17 years of experience in government support for training in industry through MDTA and CETA. The lessons of this experience are far from clear and unequivocal. There were enough individual successful programs, however, and a statistical record, in evaluation studies, that is favorable enough (though with some unanswered questions and insecure assumptions) that a general conclusion can be drawn that federal support for training in industry can be made to pay off and should continue.

No prescription for a clearly successful program can be given. A few general principles do emerge, however, One is that training on the job is potentially so helpful to the worker, by giving him or her actual industrial experience and the sense of being in a real job, as well as a good chance for continuing in the firm , that it should be part of any training or employment program for the disadvantaged and structurally unemployed.

A second is that industry should participate actively in the planning and governance of the programs, rather than be the passive objects of wooing by eager government agencies. The idea embodied in the NAB/JOBS program and in the Private Industry Councils is sound.

What is not so clear is whether government should go beyond generous and vigorous financial support for employability training of disadvantaged or structurally unemployed workers and extend its support to skill improvement for employed workers. The handicaps preventing small firms from engaging in formal training and the need to enhance productivity argue for government support. The uncertain payoff and the potential for waste lend support to the view that, though the government should encourage training, the cost should be borne by the workers who benefit or by the industry and its customers rather than by the taxpayers generally. A training system financed by industry, through a payroll tax or a levy-grant arrangement, and administered with industry and union participation, might accomplish the purpose intended and be less subject to waste or mismanagement than a system supported from general government revenues.

Finally, any device, including better evaluation studies and better statistics, that reveals the true costs and benefits of training will help to persuade industry to finance training that really pays off.

APPENDIX: SOURCES FOR DATA IN TABLE 1

The principal source is Occupational Projections and Training Data, Bulletin No. 2020 of the Bureau of Labor Statistics, 1979, which will be referred to below as Bull. 2020. For each type of institution a most typical age of graduation is given; this was used to identify the age group in 1976 used to calculate the number of graduates as a percent of the relevant age cohort. Population by age for 1976 was used.

Secondary school vocational curricula: Bull. 2020, p. 10, and 11. Age 18.

Post-secondary vocational curricula, public: same sources. Age 20.

Post-secondary vocational curricula, private: Bull. 2020, p. 12. Age 20.

Community college occupational curricula: Bull. 2020, p. 102. Age 20.

Four-year college, no graduate or professional degree: Bull. 2020, p. 16 (less first professional and masters' degrees). Age 22.

First professional degrees: Bull. 2020, p. 16. Age 24.

Graduate degrees: (masters' degrees) same source. Age 24.

Apprenticeship (registered programs). Bull. 2020, p. 13. Age 22.

Military training applicable to civilian jobs: Bull. 2020, p. 14 (less specifically military occupations: infantry, gun crews, and seamanship specialists. Number discharged from military service in fiscal year 1977 (training having been received earlier in their military service) from Office of Assistant Secretary of Defense for Manpower. Age 24.

CETA: From staff of Employment and Training Administration.

Adult vocational education: Bull. 2020, p. 10, and Department of Health, Education and Welfare, Office of Education, Summary Data: Vocational Education, Fiscal Year 1976.

Job Corps: Employment and Training Report of the President, 1977, p. 57.

REFERENCES

Becker, Gary S. Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education. New York: Columbia University Press, 1964.

_____. "Investment in Human Capital: A Theoretical Analysis." Journal of Political Economy, Vol. 70 (1962), Supplement: pp. 9-49.

Belitsky, A. Harvey. New Technologies and Training in Metal-Working. National Center for Productivity and Quality of Working Life. Washington, D.C.: The Center, 1978.

_____. Productivity and Job Security: Case Studies of Continuing Education for Engineers, Technicians and Managers. National Center for Productivity and Quality of Working Life. Washington, D.C.: The Center, 1978.

_____. Productivity and Job Security: Retraining to Adapt to Technological Change. National Center for Productivity and Quality of Working Life. Washington, D.C.: The Center, Winter 1977.

Blaug, Mark. An Introduction to the Economics of Education. Middlesex, England: Penguin Books, 1972.

_____. "The Empirical Status of Human Capital Theory: A Slightly Jaundiced Survey." Journal of Economic Literature, XIV-3 (Sept. 1976).

Blaug, Mark (ed.). Economics of Education (2 vols.). Middlesex, England: Penguin Books, 1968.

Blount, W. Frank. "The Corporate University: Training and Education in The Bell System." Testimony Before U.S. Senate Committee on Labor and Human Resources, June 6-7, 1979.

Branscomb, Lewis M., and Gilmore, Paul C. "Education in Private Industry." Daedalus, Winter 1975.

Bureau of National Affairs. Training Programs and Tuition Aid Provisions. PPF (Personnel Policies Forum). Survey No. 123, Oct. 1978.

Cain, Glen G. "The Challenge of Segmented Labor Market Theories to Orthodox Theory: A Survey." Journal of Economic Literature, XIV(4) (Dec. 1976): pp. 1215-1257.

Clark, Harold F., and Davis, Joe C. "Training in Business and Industry." In Merle E. Strong (ed.), Developing the Nation's Work Force. Yearbook 5. Washington, D.C.: American Vocational Association, 1975.

Clark, Harold F., and Sloan, Harold S. Classrooms in the Factories: An Account of Educational Activities Conducted by American Industry. Rutherford, N.J.: Fairleigh Dickinson University, 1958.

Committee for Economic Development. Jobs for the Hard-to-Employ: New Directions for a Public-Private Partnership. Washington: C.E.D., 1978.

Craig, Robert L. (ed.). Training and Development Handbook. 2nd edition. New York: McGraw Hill, 1976.

Denison, Edward F. "Some Factors Affecting Productivity Growth." In The Future of Productivity. Washington: National Center for Productivity and the Quality of Working Life, 1976, pp. 19-28.

Doeringer, Peter B., and Piore, Michael J. Internal Labor Markets and Manpower Analysis. Lexington, Mass.: D.C. Heath and Co., 1971.

_____. Internal Labor Markets, Technological Change, and Labor Force Adjustment. Report submitted to Office of Manpower Policy, Evaluation and Research, U.S. Department of Labor. Cambridge, Masschusetts: 1966.

Douglass, Gordon K. "Economic Returns on Investments in Higher Education." In Howard R. Bowen (ed.), Investment in Learning. San Francisco: Jossey-Bass Publishers, 1977, pp. 359-387.

Eckaus, R.S. "Investment in Human Capital: A Comment." Journal of Poltical Economy, Vol. 71 (1963), No. 5: pp. 501-505.

Fry, Kevin, "Job Training - Stepping Up." AFL-CIO American Federationist. May 1979, pp. 9-13.

Gilbert, Thomas F. "Training: The $100 Billion Opportunity." Training and Development Journal (Nov. 1976): pp. 3-8.

Gilpatrick, Eleanor. "Education for Work: A Full Employment Strategy." Annals, Am. Acad. of Polit. and Soc. Science (March 1975).

Hansen, Gary B., and Bentley, Marion T. Models of National Industrial Training Systems: The U.S. System. Paper presented at 7th International Conference on Training and Development, Washington, D.C., June 15, 1978. Business and Economic Development Services, Utah State University, UMC 35, Logan, Utah.

Iacobelli, John L. Training in Private Industry: Policies, Attitudes and Practices of Employers in Greater Cleveland. Manpower Research Monograph No. 22. Washington: U.S. Department of Labor, Manpower Administration, 1971.

Kerr, Clark. "Labor Markets: Their Character and Consequences." American Economic Review, 40(2) (May 1950): pp. 278-291.

Lebergott, Stanley. "Memorandum on Issues in Federal Aid." In A Government Commitment to Occupational Training in Industry, Report of the Task Force on Occupational Training in Industry, 1968, pp. 18-58.

Lusterman, Seymour. Education in Industry. New York: The Conference Board, 1977.

Luxenberg, Stan. "Education at AT&T." Change (December 1978-January 1979): pp. 26-35.

Mangum, Garth L. "The Rationale for a Public Policy Toward Training in Industry." In A Government Commitment to Occupational Training in Industry, Report of the Task Force on Occupational Training in Industry, 1968, Vol. II: Appendices, pp. 1-17.

_____, and Walsh, John. A Decade of Manpower Development and Training. Salt Lake City: Olympus Publishing Co., 1973.

Mark, Jerome A.; Kutscher, Ronald F.; and Norsworthy, John R. "Productivity Outlook to 1985: Summary of BLS Productivity Projections." In The Future of Productivity. Washington: National Center for Productivity and Quality of Working Life, 1976, pp. 9-18.

Mincer, Jacob. "On-the-Job Training: Costs, Returns, and Some Implications." Journal of Political Economy (Supplement) (Oct. 1962a.): pp. 50-79.

Morris, Albert J. "Continuing Education and Job Performance: the Casual Connection." Engineering Education (May 1979): pp. 831-837.

Myers, Charles A. The Role of the Private Sector in Manpower Development. Policy Studies in Employment and Welfare, No. 10. Baltimore: The Johns Hopkins Press, 1971.

National Commission for Manpower Policy. CETA: An Analysis of the Issues. Special Report No. 23, May 1978.

_____. An Enlarged Role for the Private Sector in Federal Employment and Training Programs. Fourth Annual Report of the Commission, Report No. 8, December 1978.

Neary, H. James. "The BLS Pilot Survey of Training in Industry." Monthly Labor Review (February 1974): pp. 26-32.

O'Meara, J. Roger. Combatting Knowledge Obsolescence: II, Employee Tuition-Aid Plans, New York: The Conference Board, 1970.

Parnes, Herbert S.; Adams, A.V.; Andrisani, P.J.; Kahn, A.I.; and Nestel, G. The Pre-Retirement Years: Five Years in the Work Lives of Middle-Aged Men. Columbus, Ohio: Center for Human Resource Research, The Ohio State University, 1974.

Perry, Charles R.; Anderson, B.E., Rowan, R.L.; and Northrup, H. The Impact of Government Manpower Programs: In General and on Minorities and Women. Philadelphia: The Wharten School, University of Pennsylvania, 1975.

Psacharopoulous, George. Education and Work: An Evaluation and Inventory of Current Research. Paris: International Institute for Educational Planning (UNESCO), 1978.

Selesnick, Herbert L. Employee Participation in Industrial Training: The Impact of Changing Values Within the American Workforce. Paper presented at the National Institute of Education Workshop on Education and Training Policy, Washington, D.C., June 1979.

Stromsdorfer, Ernst W., and Barclay, Suzanne. Occupational Training in Industry. Paper prepared for the National Institute of Education Workshop on Education and Training Policy: Workplace Perspectives, Washington, D.C., June 1979.

Swerdloff, Sol. Report on Project to Develop Data on Nonregistered Apprentices, by Occupation and Industry. Washington: U.S. Department of Labor, Employment and Training Administration, Grant No. 21-51-78-22 (1978).

Task Force on Occupational Training in Industry. A Government Commitment to Occupational Training in Industry. Washington: Superintendent of Documents, 1968; Vol. I, Report of the Task Force; Vol. II, Appendices.

U.S. Department of Commerce. Bureau of the Census. Accuracy of Data for Selected Population Characteristics as Measured by Reinterviews. 1970 Census of Population and Housing. Evaluation and Research Progress. PHC(E)-9, 1974.

_____. _____. Educational Attainment in the United States: March 1973 and 1974. Current Population Reports, Series P-20, No. 274, December 1974.

_____. _____. Vocational Training. 1970 Census of Population. Subject Reports, PC(2)-5C, 1973(?).

U.S. Department of Health, Education and Welfare. National Institute of Education. Workshop on Education and Training Policy: Workplace Perspectives. Washington, D.C., June 25-26, 1979.

_____. Office of Education. Bureau of Occupational and Adult Education. Summary Data: Vocational Education, Fiscal Year 1976. Vocational Education Information No. 1 (1978).

U.S. Department of Labor. Bureau of Labor Statistics. Characteristics of Major Collective Bargaining Agreements, July 1, 1976. Bulletin 2013 (1979).

_____. _____. Occupational Outlook Handbook, 1978-79 Edition. Bulletin 1955 (1978), pp. 447-515.

_____. _____. Occupational Projections and Training Data. Bulletin 2020, April 1979.

_____. Bureau of Labor Statistics and Employment and Training Administration. Occupational Training in Selected Metalworking Industries, 1974. BLS Bulletin 1976, ETA R&D Monograph 53 (1977).

_____. Manpower Administration. Work Force Adjustments in Private Industry - Their Implications for Manpower Policy. Manpower/Automation Research Monograph No. 7, 1968 Report of Conference.

_____. _____. Bureau of Apprenticeship and Training. Training of Workers in American Industry, 1962. Washington, D.C.: 1965.

_____. _____. Office of Manpower, Automation and Training. Formal Occupational Training of Adult Workers, 1964.

U.S Senate. Committee on Labor and Human Resources. Hearings on the Workplace and Higher Education: Perspectives for the Coming Decade, June 7, 1979.

The National Institute for Work and Learning (formerly the National Manpower Institute) is a private, not-for-profit, policy research and demonstration organization established in Washington, D.C. in 1971. NIWL is concerned with encouraging public and private sector policies and practices that contribute to the "fullest and best use of the life experience"; with eliminating artificial time-traps which segment life into youth for schooling, adulthood for working, and the rest of life for obsolescence; and with a more rational integration of education, employment and training, and economic policy.

The officers of the National Institute for Work and Learning are:

Willard Wirtz, Chairman, Board of Trustees
Archie E. Lapointe, President
Paul E. Barton, Vice President for Planning and Policy Development

Worker Education and Training Policies Project staff include:

Gregory B. Smith, Project Director
Ivan Charner, Director of Research
Jane Shore, Policy Research Associate
Vivian Lee, Executive Secretary
Shirley Faye Epps, Project Secretary
Jamshid Momeni, Research Associate
Edward Cohen-Rosenthal, Project Officer
Francis Macy, Project Consultant
Julia French, Research Librarian

Dr. Herbert Levine, Director of the Labor Education Center at Rutgers University has assisted NIWL on this project as Senior Study Consultant. The project has been advised and informed as well by a National Advisory Committee of representatives from companies, unions, and education institutions.

Nevzer Stacey, Program Officer at the National Institute of Education in the Program on Educational Policy and Organization serves as the Project Officer for the Worker Education and Training Policies Project.